INDOT Statewide Interchange Study

Final Summary Report

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December 2007

INDIANA INTERCHANGE PLANNING STUDY- 2007
FINAL SUMMARY REPORT

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1. INTRODUCTION

1.1 INDOT 2030 Long Range Transportation Plan

The INDOT 2030 Long Range Transportation Plan was last updated in June 2007. The plan "lays out a strategy for the future of the state highway system, which is intended to provide Hoosiers with the highest level of mobility and safety possible, and to meet the needs of economic development and quality of life into the next quarter century".

This study complements the strategies laid out in the Long Range Transportation Plan by evaluating improvement needs for interchange areas and identifying a prioritization for improvement of interchanges based on a relative comparison of deficiencies or need for improvement. This information can then be used in conjunction with the identification of highway improvement projects to form more complete project definition or in some instances, stand-alone interchange improvement projects.

One of the major steps in the transportation planning process is a needs assessment that includes identifying transportation facilities that provide less than desirable performance or where additional mobility is desired. The highway system is periodically evaluated to determine needs based on various performance factors. Interchanges and the need for new interchange locations represents a subset of the overall transportation system that requires separate evaluation, due to characteristics not included directly in the highway system evaluation.

1.2 Previous Interchange Planning Studies

The 2007 Interchange Planning Study is an update of previous interchange planning studies prepared by MTA in 1990 and Parsons Brinckerhoff in 2002. The primary differences between this update and the 2002 study include the following:

1. Inclusion of non-Interstate interchanges, raising the total number of interchanges considered to 353 total existing interchanges (251 Interstate and 102 non-Interstate) and 15 potential new interchange locations.
2. The 1990 study produced the interchange information in a set of 250 three-ring notebooks. The 2002 study produced a set of 12 Compact Disks for distribution. This study provides for distribution of the information via a Web based GIS Viewer.

2. PROCESS OVERVIEW FOR EXISTING INTERCHANGES

This study brings together an array of technical data related to the state's interchanges. This information has been assembled in formats suitable for broad-based analysis, and a range of data processing techniques have been applied to evaluate future needs. Major activities of this process are interchange categorization, traffic data collection, travel forecasting, engineering evaluation, capacity analysis, and potential improvement development and cost estimating. Each of these process steps is described in this section.

2.1 Interchange Categories

The fundamental purpose of this study is to provide a systematically developed data base and evaluation framework for examining future interchange needs throughout the Indiana highway system. All interchanges on the state highway system do not require detailed evaluation to achieve this purpose. Likewise, interchanges on the I-90 Indiana Toll Road are not included in this study.

In order to most effectively apply project resources, the state's interchanges were divided into a number of categories for study. Some interchange locations are new or recently modified. Others have been or are currently the subjects of in-depth engineering studies by INDOT. At some locations, traffic volumes are relatively low, accident frequency is low and interchange conditions have not changed in recent years. These categories are described in this section.

Maps of all interchanges included in this study are provided on Figures 2-1 through 2-6. In all, interchange data are provided for 354 existing interchange locations and 15 potential new interchange locations on the Indiana highway system. Appendix A provides a listing of all of the existing interchange locations included in this study and their classification.

Figure 2.1 Interchange Locations

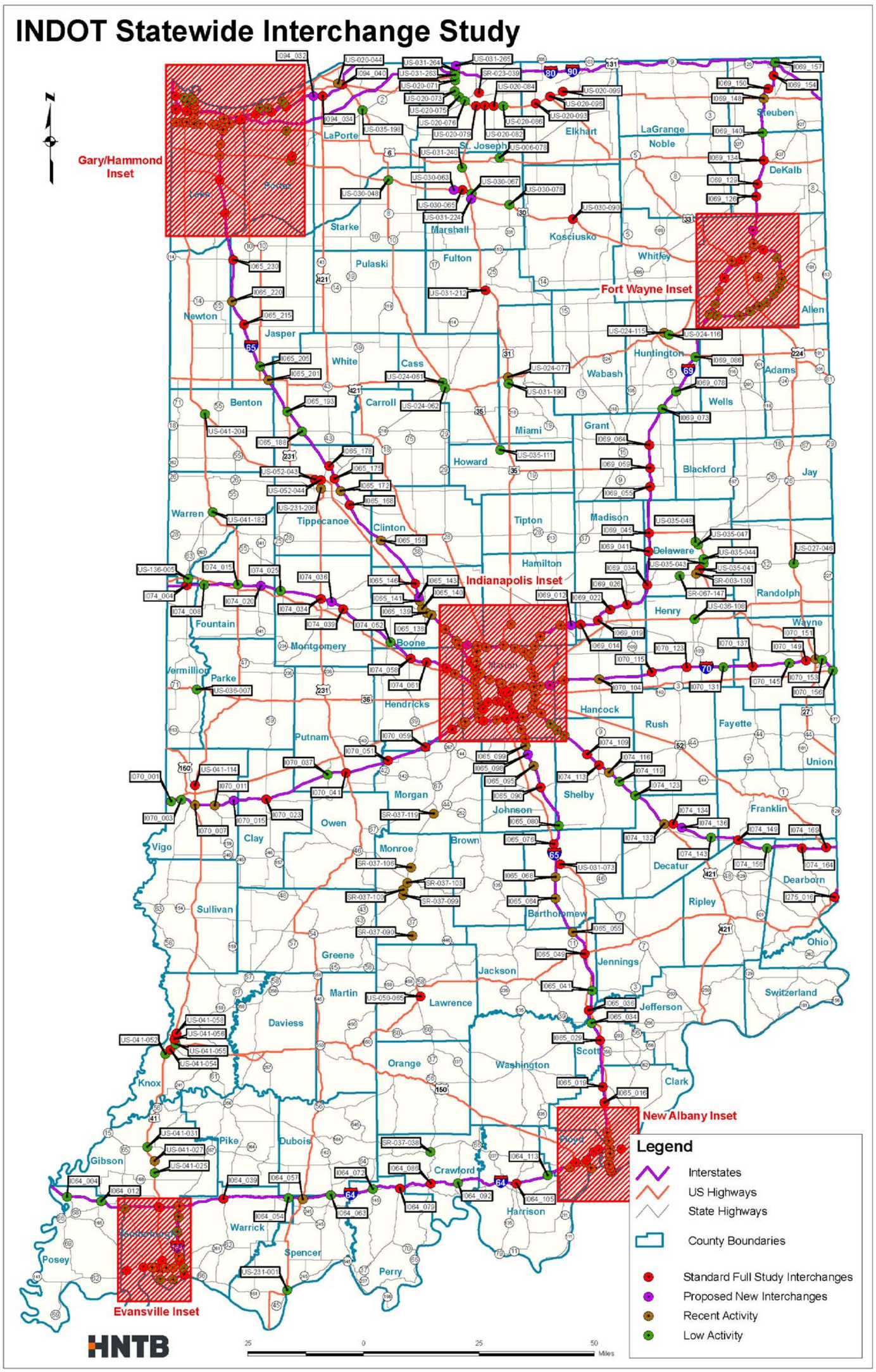


Figure 2.2 Evansville Urban Area

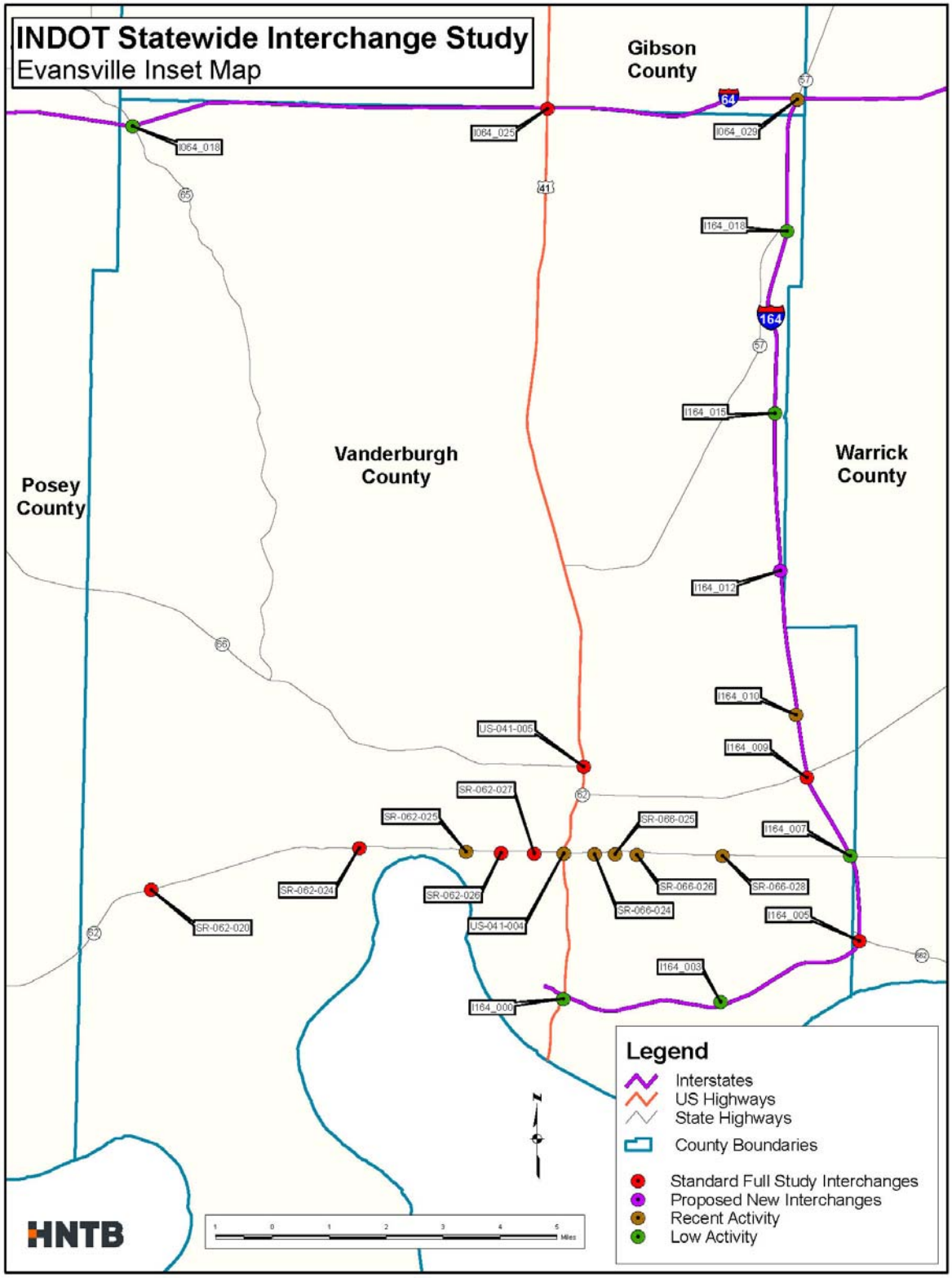


Figure 2.3 Fort Wayne Urban Area

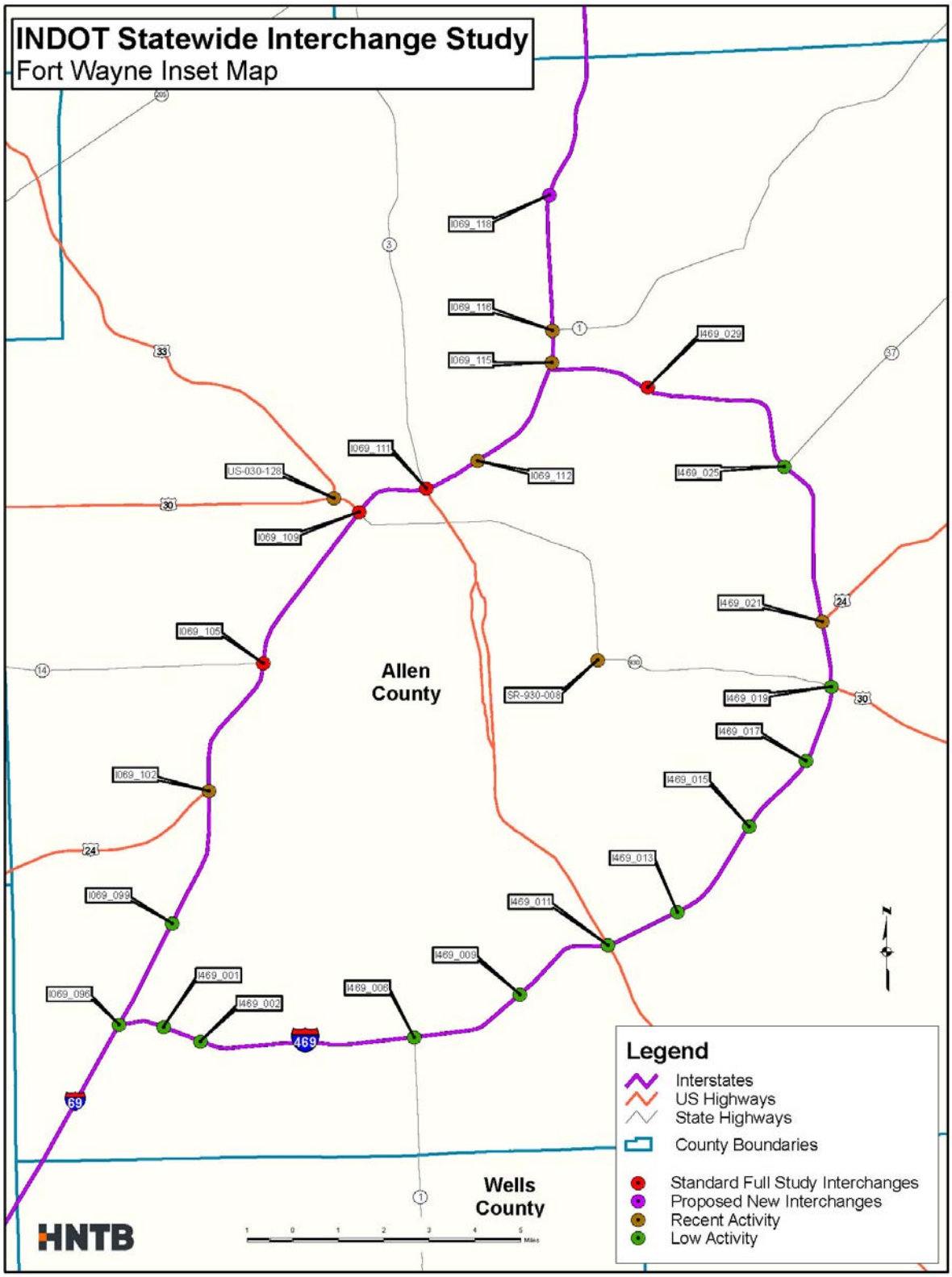


Figure 2.4 Gary/Hammond Urban Area

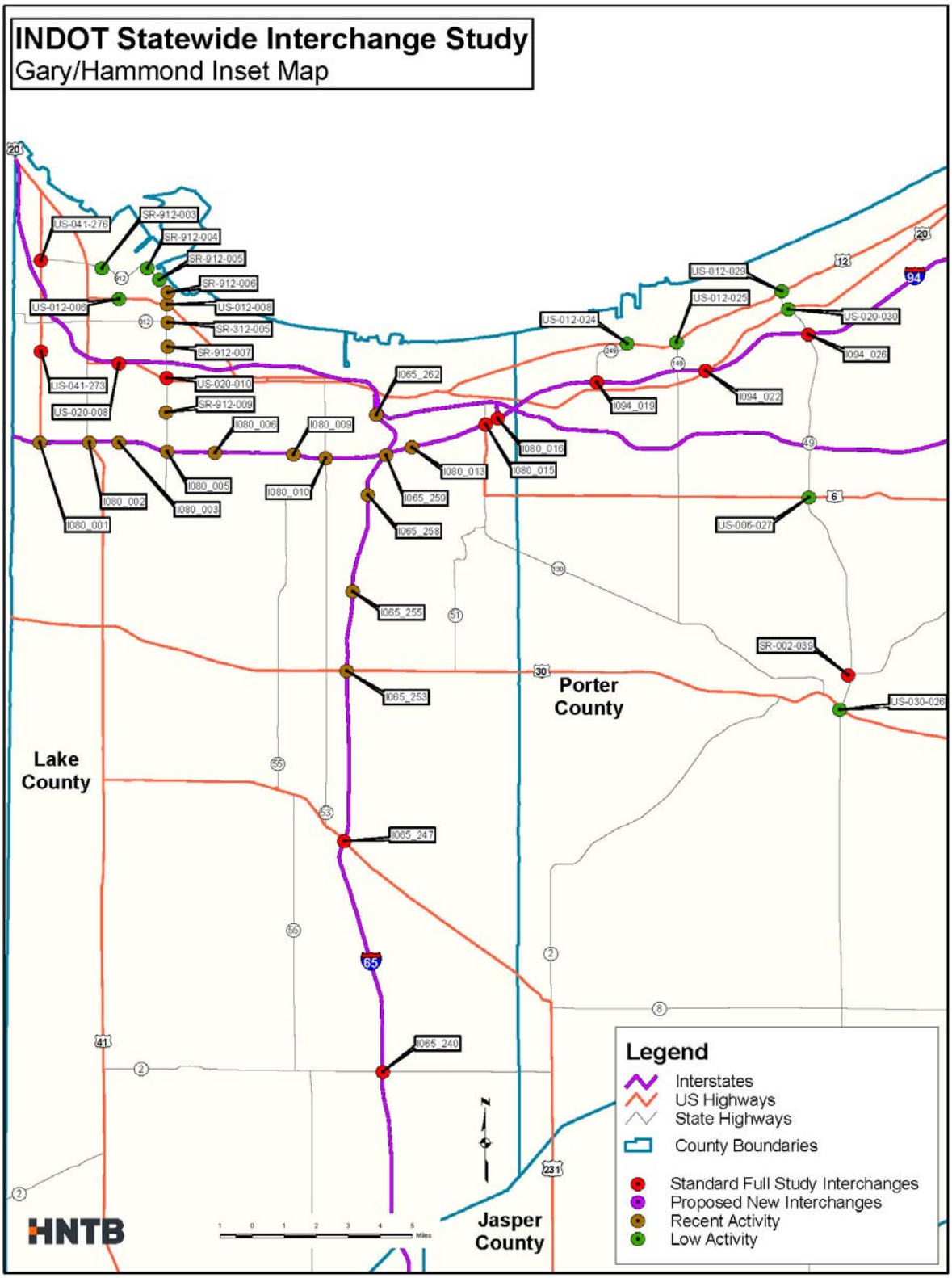


Figure 2.5 Indianapolis Urban Area

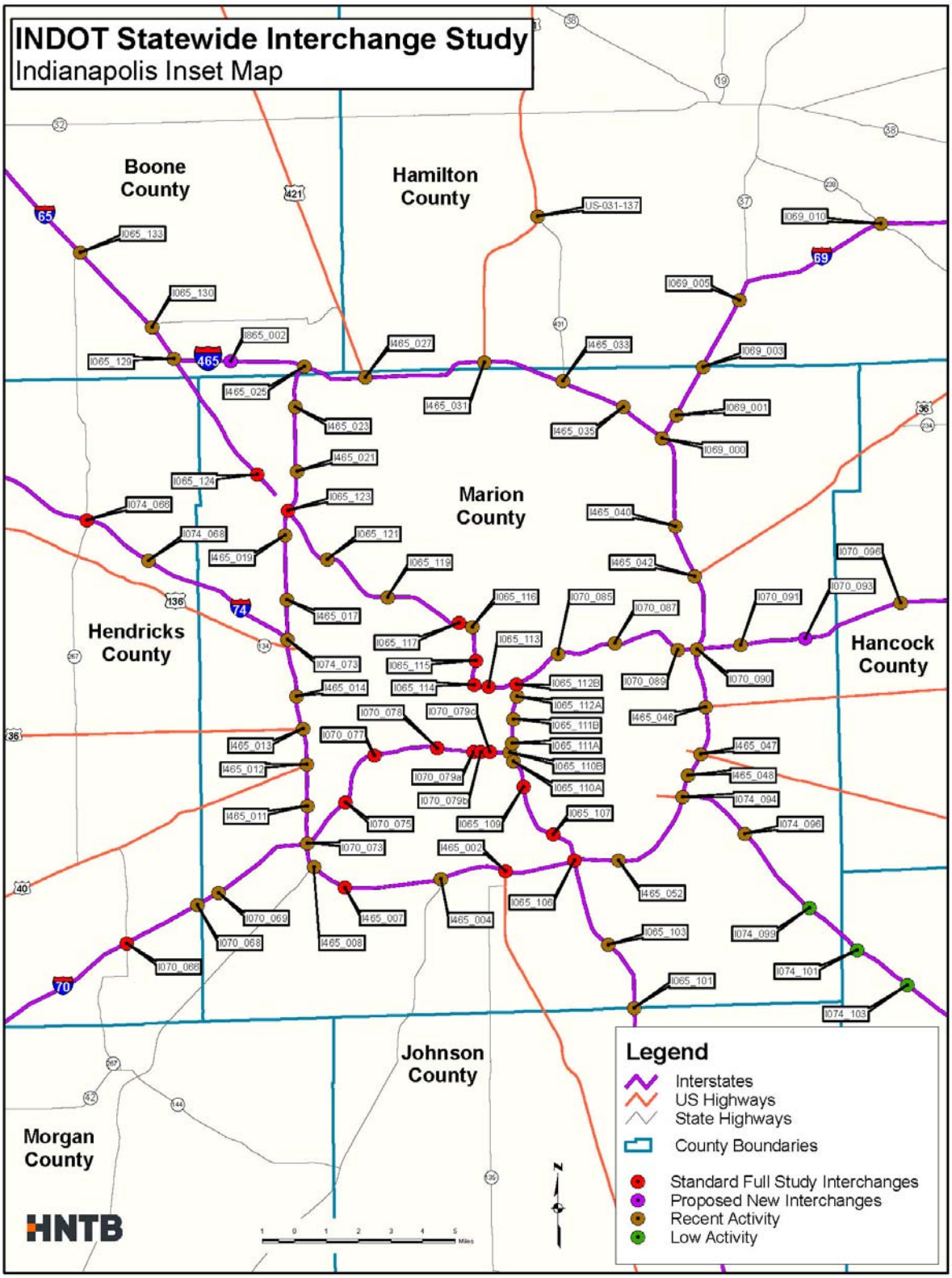
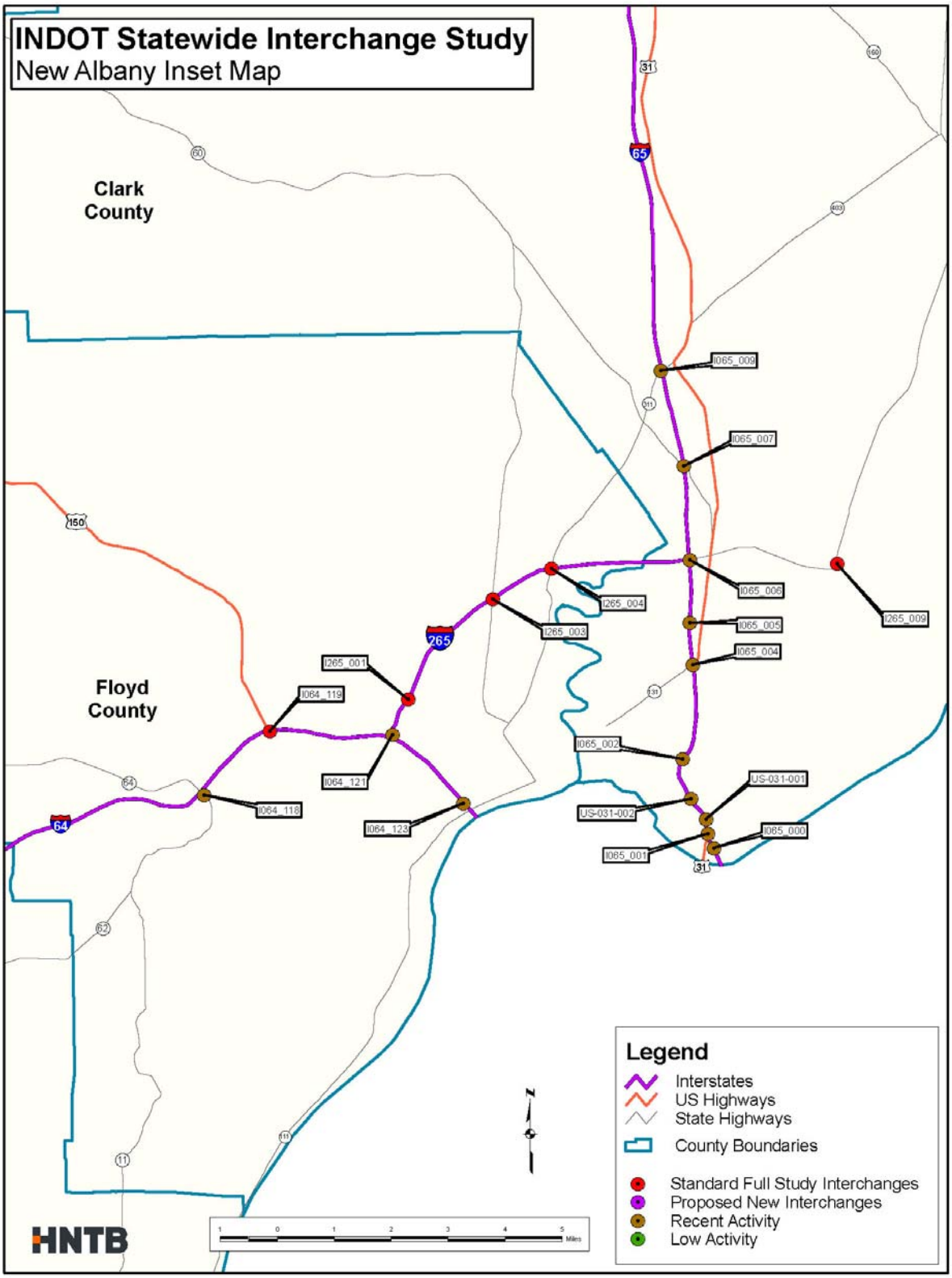


Figure 2.6 New Albany Urban Area



RECENTLY CONSTRUCTED, STUDIED OR MODIFIED INTERCHANGES

INDOT maintains a continuing program of highway system study and improvement. Interchange areas that have been recently studied as part of a pre-engineering report, programmed for improvements (regardless of the design stage), recently improved or are under construction do not require independent evaluation. These interchanges did not receive a full evaluation in this study. A total of 132 interchange locations were identified as recently studied or constructed and are identified as "Recent Activity" interchanges. To provide the most cost effective planning effort, each existing interchange location was reviewed to determine whether it met one of the criteria for classifying it as a "Recent Activity" interchange. For example, interchanges on I-65 just north of the Ohio River have been recently reconstructed or will be designed as part of the Ohio River Bridge project. Likewise many interchanges are planned to be studied in detail as part of future design projects. Table 2-1 shows the listing of the "Recent Activity" interchanges and a brief description of the reason for the classification. See Figures 2.1 through 2.6 for interchange location and category information.

Information concerning recent construction or programmed improvements has been included in the Interchange Reports for these interchanges. Evaluation criteria including accident statistics and growth potential are included in the interchange reports.

LOW-VOLUME, LOW-ACCIDENT AND LOW GROWTH INTERCHANGES

There are 99 interchanges that exhibit, relative to other interchange locations, low traffic volumes, low accident history and low traffic growth. The priority rankings of the Interstate interchanges studied in 2002 were considered in the selection of interchanges for this category. Most of these interchanges are located in rural areas that have experienced very little land use and traffic volume change since the last statewide interchange study. These interchanges did not receive a full evaluation and are identified as "Low Activity" interchanges.

"STANDARD" INTERCHANGES

"Standard Interchanges" were selected for a complete planning evaluation following the identification of "Recent Activity" and "Low Activity" interchanges. Several interchanges were also included for evaluation based on requests by INDOT district planning and development engineers. Of the 354 existing interchange locations, 122 interchanges were selected for full evaluation as "Standard Interchanges".

POTENTIAL NEW INTERCHANGES

In addition to the existing and programmed interchanges included in the study, INDOT staff identified fifteen (15) potential new interchange locations for study. The selection of potential new interchange locations was an iterative process of reviewing locations that had been identified by INDOT and local agencies. Proposed locations were reviewed for reasonableness and issues that would eliminate them from consideration.

Similar to identifying study categories for existing interchanges, potential new interchange locations were reviewed to determine if a location had been recently studied or would be studied in more detail as part of a future project. For example, the new interchange location of Ronald Reagan Parkway and I-74 has been studied previously and is part of a programmed design/construction project. Likewise a potential new interchange location at I-69 and 106th Street would be studied in more detail as part of the I-69 corridor improvements (DES #0400356) design/construction project. Previous issues raised regarding less than desirable interchange spacing could be addressed through design alternatives such as collector-distributor roads.

Each of the selected locations was reviewed using a systematic approach that considers FHWA Interstate access requirements, INDOT Planning Oversight Committee (IPOC) procedures for selecting major new capacity projects, potential transportation benefits (state and local systems), potential environmental impact, and local/regional planning support. Using a modified format, interchange reports and supporting data are provided for each potential new location.

Table 2-1. Listing of "Recent Activity" Interchange Locations

Interchange Location ID	Intersecting Route	INDOT District	Comments (Note: DES numbers may have changed since the initial review early in the study process)
I-064-029	I-164 / SR 57	Vincennes	Interchange is at the southern terminus of the I-69 corridor, which is currently being designed.
I-064-057	US 231	Vincennes	INDOT has designed a new interchange which was let out to contract, but has never been awarded. The old existing Interchange is to be removed per Dale Lucas.
I-064-118	SR 62 / SR 64	Seymour	Included in design RFP-06-06; Const. Scheduled @ SR62 and SR64 including Interchange Modifications - (2010) - DES 0101102
I-064-121	I-265	Seymour	Design scheduled for RFP 5/8/07
I-064-123	Spring / West Spring/Elm	Seymour	Design scheduled for RFP 5/8/07
I-065-000	Market / Riverside Dr.	Seymour	Part of the Ohio River bridge reconstruction
I-065-001	Court St.	Seymour	Recently reconstructed
I-065-002	Eastern	Seymour	Recently reconstructed
I-065-004	US 31 / Lewis & Clark	Seymour	Recently reconstructed
I-065-005	Intercity Route	Seymour	Recently reconstructed
I-065-006	I-265	Seymour	Recently reconstructed
I-065-007	SR 60	Seymour	Recently reconstructed
I-065-009	SR 311	Seymour	Recently reconstructed
I-065-055	SR 11	Seymour	Construction Scheduled w/ Interchange Modifications DES 0401145
I-065-064	SR 58	Seymour	Construction Scheduled @ SR58 - (2010)- Includes Interchange Modifications - DES 0101101
I-065-068	SR 46	Seymour	Recently reconstructed
I-065-095	CR500N / Whiteland Rd.	Seymour	Construction Scheduled w/ Interchange Modifications Major Moves program RFP 2/13/2007
I-065-099	CR950N / Greenwood Rd.	Seymour	Construction Scheduled w/ Interchange Modifications Major Moves program RFP 2/13/2007
I-065-101	County Line Road	Seymour	Construction Scheduled w/ Interchange Modifications Major Moves program RFP 2/13/2007
I-065-103	Southport	Greenfield	Construction Scheduled w/ Interchange Modifications Major Moves program RFP 2/13/2007
I-065-110A	I-70(W) / Morris St.	Greenfield	Recent mainline reconstruction
I-065-110B	McCarty/East / Fletcher/Virginia	Greenfield	Recent mainline reconstruction
I-065-111A	Market	Greenfield	Recent mainline reconstruction
I-065-111B	Ohio	Greenfield	Recent mainline reconstruction
I-065-112A	Michigan St.	Greenfield	Recent mainline reconstruction
I-065-116	30th	Greenfield	Route concept report prepared by INDOT
I-065-119	38th	Greenfield	Recently reconstructed
I-065-121	Lafayette	Greenfield	Recently reconstructed
I-065-129	I-865	Greenfield	MM Preservation for 2007 DES 400599; MM New Construction for 2013 DES200903
I-065-130	SR 334	Crawfordsville	MM Preservation for 2007 DES 400599; MM New Construction for 2013 DES200903
I-065-133	SR 267	Crawfordsville	MM Preservation for 2007 DES 400599; MM New Construction 2014-2015 DES 200904
I-065-138	Indianapolis	Crawfordsville	MM Preservation for 2007 DES 400599; MM New Construction 2014-2015 DES 200904
I-065-139	SR 39	Crawfordsville	MM Preservation for 2007 DES 400599; MM New Construction 2014-2015 DES 200904
I-065-140	SR 32	Crawfordsville	MM Preservation for 2007 DES 400599; MM New Construction 2014-2015 DES 200904
I-065-141	US 52	Crawfordsville	MM Preservation for 2007 DES 400599; MM New Construction 2014-2015 DES 200904
I-065-158	SR 28	Crawfordsville	MM New Construction for 2008 DES 101169; included in Interchange Mod. Design in RFP-06-06, Construction Scheduled w/ Interchange Modifications DES-0101169
I-065-172	SR 26	Crawfordsville	MM New Construction 2008 DES 9802780; construction scheduled w/ Interchange Modifications DES-9802780
I-065-201	US 24	LaPorte	MM Preservation for 2011 300456
I-065-220	SR 14	LaPorte	Recently constructed
I-065-253	US 30	LaPorte	Recently reconstructed
I-065-255	61st	LaPorte	Recently reconstructed
I-065-258	37th / Ridge Rd.	LaPorte	Recently reconstructed
I-065-259	I-80 / I-94	LaPorte	I-80 @ I-65 (from MLK Dr. to Central Ave.) Construction Scheduled w/ Interchange Modifications DES-0500590-0500593-0065300)
I-065-262	E. 15th Ave. / I-90	LaPorte	Recently Reconstructed as part of the Toll Road Interchange I-90_017 improvement

Table 2-1. Listing of "Recent Activity" Interchange Locations, cont.

Interchange Location ID	Intersecting Route	INDOT District	Comments (Note: DES numbers may have changed since the initial review early in the study process)
I-069-000	I-465	Greenfield	MM New Construction 2014 DES 400283; Construction Scheduled w/ Interchange Modifications Major Moves program RFP 3/13/2007
I-069-001	82nd	Greenfield	MM New Construction 2014 DES 400283; Construction Scheduled w/ Interchange Modifications Major Moves program RFP 3/13/2007
I-069-003	96th	Greenfield	Recently reconstructed and is part of a programmed project DES 0400308.
I-069-005	116th / SR 37	Greenfield	Construction Scheduled w/ Interchange Modifications DES 0400356
I-069-010	SR 238	Greenfield	Construction Scheduled w/ Interchange Modifications -(2006) - DES 9133885
I-069-102	US 24	Fort Wayne	Recently modified
I-069-112	Coldwater	Fort Wayne	MM New Construction for 2007 DES 9829980
I-069-115	I-469	Fort Wayne	MM New Construction for 2007 DES 9829980
I-069-116	SR 1 / Dupont Rd	Fort Wayne	MM New Construction for 2007 DES 9829980
I-069-148	US 20	Fort Wayne	MM New 300942 2010, Included in Interchange Mod. Design in RFP-06-06, Construction Scheduled w/ Interchange Modifications DES-0300942
I-070-007	US 41 / US 150	Crawfordsville	Construction Scheduled @ US41 -(2008)- Includes Interchange Modifications - DES 9804330
I-070-011	SR 46	Crawfordsville	MM New Construction for 2012 DES 200305 (SR 641 Project), MM Preservation in 2006 DES 400059
I-070-068	SixPoints / Bridgeport	Crawfordsville	Recently constructed
I-070-069	Airport Entrance	Crawfordsville	Recently constructed
I-070-073	I-465(W)	Greenfield	MM New Construction for 2010 DES 300349
I-070-085	Rural / Keystone	Greenfield	Recently reconstructed
I-070-087	Emerson	Greenfield	Recently reconstructed
I-070-089	Shadeland	Greenfield	Recently reconstructed
I-070-090	I-465(E)	Greenfield	Recently Reconstructed
I-070-091	Post	Greenfield	Construction Scheduled w/ Interchange Modifications Major Moves program RFP 2/13/2007
I-070-096	MtComfort	Greenfield	MM New Construction for 2013 DES 200699; construction scheduled @ Mt. Comfort Rd. - Includes Interchange Modifications - DES 9706740
I-070-104	SR 9	Greenfield	MM Preservation for 2008 DES 500537; MM New Construction for 2014 DES 200700; construction scheduled w/ Interchange Modifications Major Moves program RFP 2/13/2007
I-070-151	US 27	Greenfield	MM New Construction for 2006 DES 9502960. Const. from south to north of I-70 - Includes Interchange Modifications - DES 9502960
I-074-068	Ronald Reagan Blvd.	Crawfordsville	MM New Construction for 2007 DES 400563. This potential interchange is in the INDOT & MPO Plans (with an IJR issued)
I-074-073	I-465(W)	Greenfield	MM New Construction for 2011 DES 300371
I-074-094	I-465(E)	Greenfield	Recently Reconstructed
I-074-096	Post Rd	Greenfield	MM New Construction for 2015 DES 100968; Construction Scheduled @ Post Road Interchange w/ Interchange Modifications DES-0100968
I-074-116	SR 44	Greenfield	MM Preservation for 2011 DES 500014
I-074-132	US 421	Seymour	Interchange recently modified for new Honda plant.
I-080-001	Calumet Ave / US 41	LaPorte	Borman Reconstruction
I-080-002	SR 152 / US 41	LaPorte	Borman Reconstruction
I-080-003	Kennedy	LaPorte	Borman Reconstruction
I-080-005	SR 912 / Cline Ave	LaPorte	Borman Reconstruction
I-080-006	Burr	LaPorte	Borman Reconstruction
I-080-009	Grant	LaPorte	Borman Reconstruction
I-080-010	SR 53 / Broadway	LaPorte	Borman Reconstruction
I-080-013	Central	LaPorte	MM New Construction (DES 500590 2007), (DES 65300 2008), (DES 500593 2009)
I-164-010	Lynch Rd.	Vincennes	Interchange was recently constructed with local funding
I-465-004	SR 37	Greenfield	MM Preservation 300384 2006, MM New 9802810 2010 Construction Scheduled @ SR37 w Interchange Modifications DES-9802810
I-465-008	SR 67 / Kentucky Ave	Greenfield	MM Preservation in 2006 DES 300384
I-465-011	Airport Expwy	Greenfield	MM New Construction in 2009 DES 9829310, I-465 Westside project
I-465-012	US 40 / Washington	Greenfield	MM New Construction in 2008 DES 300371, I-465 Westside project
I-465-013	US 36 / Rockville Rd	Greenfield	MM New Construction in 2008 DES 9829410, I-465 Westside project
I-465-014	10th	Greenfield	I-465 Westside project
I-465-017	38th	Greenfield	MM New Construction in 2007 DES 9829610, I-465 Westside project
I-465-019	56th	Greenfield	I-465 Westside project
I-465-021	71st St	Greenfield	Recently reconstructed

Table 2-1. Listing of "Recent Activity" Interchange Locations, cont.

Interchange Location ID	Intersecting Route	INDOT District	Comments (Note: DES numbers may have changed since the initial review early in the study process)
I-465-023	86th	Greenfield	Recently reconstructed
I-465-025	I-865	Greenfield	MM Preservation in 2006 DES 300385
I-465-027	US 421 / Michigan Rd	Greenfield	MM Preservation in 2006 DES 300385
I-465-031	US 31 / Meridian	Greenfield	MM Preservation in 2006 DES 300385
I-465-033	SR 431 / Keystone	Greenfield	MM New Construction for 2015 DES 400289; Construction Scheduled w/ Interchange Modifications Major Moves program RFP 3/13/2007
I-465-035	Allisonville	Greenfield	MM New Construction for 2015 DES 400289; Construction Scheduled w/ Interchange Modifications Major Moves program RFP 3/13/2007
I-465-040	56th St / Shadeland	Greenfield	Recently reconstructed
I-465-042	US 36 / SR 67	Greenfield	Recently reconstructed
I-465-046	US 40 / Washington	Greenfield	Recently reconstructed
I-465-047	US 52 / Brookville	Greenfield	Recently reconstructed
I-465-048	SR 100 / Shadeland	Greenfield	Recently reconstructed
I-465-052	Emerson	Greenfield	Recently reconstructed
I-469-021	US 24	Fort Wayne	MM Preservation for 2008 DES 501202, Part of US 24 Fort to Port Study
SR-003-130	SR 67	Greenfield	Construction Scheduled w/ Interchange Improvements DES-0013780
SR-037-090	Monroe Dam Rd.	Seymour	Construction Scheduled w Interchange Modifications DES0401164
SR-037-099	SR 45 / W. Bloomfield Rd.	Seymour	Interchange in the I-69 Corridor and DES 0101284
SR-037-100	SR 48 / W. 3rd St.	Seymour	Interchange in the I-69 Corridor and DES 0101284
SR-037-103	SR 46 / SR 45	Seymour	Interchange in the I-69 Corridor
SR-037-106	N. Walnut St.	Seymour	Interchange in the I-69 Corridor
SR-037-119	SR 39	Seymour	Interchange in the I-69 Corridor
SR-062-025	1st Ave.	Vincennes	Part of a Corridor study 2 years ago per John Curry
SR-066-024	Englewood Ave.	Vincennes	Part of a Corridor study 2 years ago per John Curry
SR-066-025	Weinbach Ave.	Vincennes	Part of a Corridor study 2 years ago per John Curry
SR-066-026	Boeke Rd.	Vincennes	Part of a Corridor study 2 years ago per John Curry
SR-066-028	Green River Rd.	Vincennes	recently reconstructed per John Curry - DES 9623010
SR-312-005	SR 912 / Cline Ave.	LaPorte	Recently reconstructed
SR-912-006	Martin Luther King Dr.	LaPorte	Recently reconstructed
SR-912-007	Gary Ave.	LaPorte	Recently reconstructed
SR-912-009	169th St.	LaPorte	Recently reconstructed
SR-930-008	Washington Blvd.	Fort Wayne	Construction schedul includes Interchange Modifications for 2007 - DES 0400012, Under study per Ben Shaffer 3-22-06
US-012-008	SR 912 / Columbus Dr.	LaPorte	Interchange modification Project DES 9380921 from SPMS?
US-020-044	US 35 / SR 212	LaPorte	Construction Scheduled (Ramp from EB US 20 to EB US 20/35) - (2011) - DES-0014050
US-024-077	US 31	Fort Wayne	Recently reconstructed per Ben Shaffer
US-024-115	SR 9 / Misher Rd.	Fort Wayne	Recently reconstructed per Ben Shaffer
US-030-128	US 33	Fort Wayne	Construction Schedule w/ Interchange Modifications DES-9229905 (or 9904160?)
US-031-001	10th & Old SR 62	Seymour	Recently reconstructed. New configurations will have to be developed from 2005 aerials and construction plans. - Cross Road Changed per Seymour District
US-031-002	Stanisfer Ave.	Seymour	Recently reconstructed. New configurations will have to be developed from 2005 aerials and construction plans.
US-031-137	SR 431	Greenfield	MM DES 0400117 New Construction (freeway), No ramps in system route files. Listed as US-031-129 on count station graphic sheet.
US-041-004	SR 62 / SR 66	Vincennes	Construction Scheduled w Interchange Modifications @ South Junction SR62/SR66 DES 0015020, EA in 2002, design engineer selected per John Curry
US-041-027	Old US 41 South / Kings Mine Rd.	Vincennes	District recommends a study due to Toyota Expansion, more development & tying in county road. This interchange was recently constructed to serve the Toyota Plant and additonal study at this time is not recommended by the Study Committee.
US-231-206	SR 43 / River Rd.	Crawfordsville	US 231 has been rerouted through Lafayette. US-231-205 no longer US Highway System

2.2 Travel Forecasting

This study considers forecasted interchange operating conditions for the year 2030. The primary tool used to provide these forecasts was the statewide TransCAD Travel Demand Model maintained by INDOT. In order to incorporate localized turning movements, which are not ordinarily output directly by a statewide model, the model was used to provide growth factors for use in developing projections from existing data.

Most of the base traffic data on main lines and ramps was provided by INDOT from its ongoing counting program. Other traffic data was taken from the model. As a part of this study, limited turning movement counts were taken at the ramp intersections for approximately 50 interchanges throughout the state system. The existing system data was compiled in a manner suitable for further processing.

A number of adjustments were necessary to prepare the state's travel demand model for use in this study. These are briefly described below:

NO-BUILD UNRESTRAINED GROWTH FACTOR DEVELOPMENT

Traffic Volume growth factors were developed for each interchange link to represent the growth in existing traffic to the Year 2030. The long range plan network, including proposed road improvements from the INDOT Long Range Plan, was used for modeling 2030 volumes. Typically, a growth factor was calculated by dividing the future ADT volume by the base year ADT volume. AM and PM peak hour volumes were computed for the forecast year by applying the implied growth rates applied to each base year, peak hour count. Traffic volumes were balanced, as necessary, between intersections within each interchange to provide consistent volume and capacity analysis results for the entire interchange. Forecast traffic summary data sheets were prepared for each intersection.

FORECASTS FOR EXISTING INTERCHANGES NOT PREVIOUSLY CODED

At the beginning of this study, there were a total of 20 existing interchange locations that were not adequately reflected in the Indiana Statewide Travel Demand Model (ISTDM). Ten were Interstate interchanges and ten were non-Interstate interchanges. These locations, most of which were interchanges with local roads, either were missing entirely or were missing one approach. These interchanges were coded into the model and affected roads and centroid connectors were adjusted as necessary. Additionally, a separate model network was developed to include the 15 potential new interchanges. Two interchanges (I-70 at German Church Road and I-69 at Gump Road/Hursh Road) had been coded in the ISTDM already as part of the long range plan network—these were removed from the long range plan network and were added to the potential new interchange network.

Growth factors were computed as described previously for the full study interchanges coded in the travel demand model network. Growth factors were computed using the absolute or percentage increase from the base to future year assignments. These growth factors were then applied to base year observed data to generate future expected volumes for each interchange. PM peak hour approach and turning movements were estimated by applying the growth factors to existing hourly approach counts, turning movement counts or estimated turning movements.

2.3 Engineering Evaluation

The engineering evaluation for the selected "standard" interchanges identified and summarized values for the factors needed for the priority index (needs prioritization) calculations. These factors and associated scoring data are briefly described below. All site-specific engineering evaluation data is summarized in the interchange reports and supporting data.

ACCIDENT FREQUENCY AND SEVERITY

Accident data was provided by INDOT for three years (2003 – 2005) with geo-coded location information in latitude and longitude. The accident data pertinent to the study's evaluation criteria was extracted from the accident records. Buffer areas for each interchange location, encompassing both the main road and cross road, were developed in GIS and the accidents occurring within those buffer areas were tabulated. Accidents were categorized according to severity, indicating property damage, personal injury, or fatalities. These were weighted with a factor of 1, 2, or 4, respectively. Accident information is summarized in the interchange reports and is input into the needs prioritization process described in Chapter 4.

ACCIDENT RATES

The accident rate was calculated for each interchange based on the accident severity divided by the total number of existing vehicles entering an interchange on a daily basis. Although the total number and severity of accidents occurring at an interchange is an important factor in the comparison of the need for interchange improvement, the accident rate is an indicator of performance related to total traffic volumes. For example, one interchange may have twice as many accidents as another interchange, but if the traffic volumes are also twice as much, the interchanges are equal relative to the performance measured by accidents per 1,000,000 vehicles entering the interchange.

TRAFFIC OPERATIONS

Forecasted (2030) levels of service (LOS) were computed within each study interchange based on methods presented in the 2000 Highway Capacity Manual. (A detailed description

of the computation process is provided in the next chapter.) An average future level of service is used for scoring, computed by averaging the most deficient service levels in weaving areas, in merge areas, on ramps, and at ramp terminal/crossroad intersections. Level of service is weighted with 1 for LOS A through C, 2 for LOS D, 4 for LOS E, and 8 for LOS F. The computed LOS is presented for all locations analyzed in the interchange reports.

FUTURE TRAFFIC VOLUMES

In itself, the estimated future traffic volume entering an interchange is not a measure of deficiency or performance. It is, however, an indicator of exposure of interchange deficiencies to highway users. For example, the same poor level-of-service at an interchange intersection would have a greater cumulative impact on users at an interchange with 200,000 daily entering vehicles compared to an interchange with only 50,000 daily vehicles. In other words, total vehicle delay would be greater at the higher volume interchange. Any interchange deficiencies would be experienced by a greater or lesser number of users depending on the total number of vehicles traversing the interchange. Therefore, this factor is a measure of daily "exposure" to the interchange conditions.

GEOMETRIC DEFICIENCIES

Horizontal and vertical geometry was evaluated based on applicable INDOT design standards and guidelines of the American Association of State Highway and Transportation Officials (AASHTO). Design speeds were calculated from the geometric information and compared to the speed limit or the design speed shown in the design plans for the interchange, whichever was greater. Other design deficiencies were identified through the use of lookup tables of current design standards. The following design features were included in this review: pavement widths, shoulder widths, median widths, ramp geometry, bridge clearances, horizontal clearances, obstructions and sight distance restrictions. The qualitative review of these factors is provided in terms of number and type of geometric deficiencies in the interchange reports.

INTERCHANGE GROWTH RATE

Growth rates for each interchange were computed based on the forecasted 2030 total daily entering traffic divided by the year 2000 total daily entering traffic. Growth rates are a measure of how quickly performance indicators could change and the need for improvements increase relative to the other interchanges. In other words, different traffic volume growth rates will affect future needs priority comparisons. Higher growth rates indicate a greater need for improvements relative to interchanges with lower growth rates. Growth rates are provided in the interchange reports.

As discussed in the Traffic Forecasting Section, traffic growth rates are directly related to estimated county population, households, and employment projections for the Year 2030. Table 2-2 shows the growth factors used for the county projections, which were applied to the Traffic Analysis Zones (TAZ) in the travel demand model.

Table 2-2. County Demographic Growth Factors 2000 to 2030

State County Number	County Name	2000 - 2030 Population Growth Factor	2000 - 2030 Employment Growth Factor	2000 - 2030 Household Growth Factor
1	Adams	1.22	1.24	1.26
2	Allen	1.27	1.23	1.31
3	Bartholomew	1.26	1.22	1.32
4	Benton	0.84	0.94	0.86
5	Blackford	0.88	0.84	0.92
6	Boone	1.67	1.69	1.72
7	Brown	1.10	1.05	1.17
8	Carroll	1.05	1.14	1.08
9	Cass	1.02	0.99	1.03
10	Clark	1.28	1.25	1.35
11	Clay	1.05	1.06	1.07
12	Clinton	1.11	1.13	1.13
13	Crawford	1.28	1.38	1.35
14	Daviess	1.10	1.18	1.08
15	Dearborn	1.58	1.53	1.63
16	Decatur	1.08	1.09	1.20
17	Dekalb	1.31	1.30	1.37
18	Delaware	1.10	1.12	1.17
19	Dubois	1.18	1.16	1.22
20	Elkhart	1.27	1.23	1.27
21	Fayette	0.95	0.90	1.01
22	Floyd	1.29	1.23	1.33
23	Fountain	0.98	1.03	1.01
24	Franklin	1.17	1.27	1.22
25	Fulton	1.07	1.06	1.10
26	Gibson	1.07	1.22	1.09
27	Grant	0.87	0.81	0.90
28	Greene	1.06	1.00	1.12
29	Hamilton	2.26	1.75	2.35
30	Hancock	1.66	1.66	1.82
31	Harrison	1.46	1.51	1.54
32	Hendricks	2.15	2.15	2.32
33	Henry	0.92	0.88	0.97
34	Howard	1.06	1.05	1.14
35	Huntington	1.22	1.22	1.28
36	Jackson	1.07	1.08	1.15
37	Jasper	1.15	1.13	1.16
38	Jay	0.93	0.94	0.92
39	Jefferson	1.17	1.16	1.23
40	Jennings	1.25	1.25	1.31
41	Johnson	1.72	1.73	1.83
42	Knox	0.97	0.90	0.98
43	Kosciusko	1.14	1.13	1.19
44	LaGrange	1.40	1.27	1.45
45	Lake	1.06	1.04	1.07
46	LaPorte	1.05	1.03	1.06
47	Lawrence	1.01	0.97	1.11
48	Madison	1.09	1.07	1.17
49	Marion	1.11	1.10	1.16
50	Marshall	1.21	1.22	1.26
51	Martin	0.94	0.91	0.97
52	Miami	0.93	0.90	1.01
53	Monroe	1.32	1.29	1.48
54	Montgomery	1.11	1.11	1.12
55	Morgan	1.45	1.44	1.56
56	Newton	1.00	1.03	1.02
57	Noble	1.16	1.17	1.17
58	Ohio	1.12	1.21	1.17
59	Orange	1.10	1.00	1.19
60	Owen	1.19	1.17	1.25
61	Parke	0.98	1.02	1.00
62	Perry	1.00	0.92	1.02
63	Pike	1.04	1.11	1.04
64	Porter	1.13	1.11	1.15
65	Posey	1.10	1.13	1.12
66	Pulaski	1.03	1.11	1.08
67	Putnam	1.17	1.12	1.25
68	Randolph	0.95	0.94	1.00
69	Ripley	1.16	1.15	1.20
70	Rush	0.89	0.92	0.95
71	St. Joseph	1.17	1.11	1.21
72	Scott	1.17	1.11	1.25
73	Shelby	1.07	1.04	1.14
74	Spencer	1.00	0.99	1.01
75	Starke	1.01	0.97	1.08
76	Steuben	1.12	1.11	1.15
77	Sullivan	1.08	1.10	1.12
78	Switzerland	1.26	1.48	1.29
79	Tippecanoe	1.37	1.39	1.48
80	Tipton	0.97	0.99	1.04
81	Union	1.01	1.07	1.05
82	Vanderburgh	1.08	1.16	1.10
83	Vermillion	0.93	0.91	0.96
84	Vigo	0.99	1.07	1.03
85	Wabash	0.98	0.94	1.03
86	Warren	0.97	1.11	1.02
87	Warrick	1.36	1.24	1.43
88	Washington	1.18	1.18	1.20
89	Wayne	0.90	0.88	0.95
90	Wells	1.16	1.23	1.19
91	White	1.04	1.04	1.05
92	Whitley	1.24	1.23	1.31

Forecasted Growth from Year 2000 to Year 2030 for Indiana

Population Growth = 1.21
Employment Growth = 1.18
Number of Households = 1.25

2.4 Truck Operations

Truck operations have received additional consideration in this study update in recognition of the disproportionate effect that trucks have on traffic operations. A 2003 INDOT Study on the perspective of freight stakeholders identified the following issues in Chapter 5 of that report

> "Substandard physical geometrics at older interchanges and ramps – trucking carriers identified tight turning radii, confined lane widths, poor sightlines, and short merges at older interchanges as a safety concern for commercial vehicles. In addition to exacerbating congestion, these substandard geometries increase the danger of truck rollovers and other accidents. INDOT has already begun a program of interchange upgrades on some of its older and more heavily used highways, such as I-465 in Indianapolis."

This study addresses truck issues in three primary ways. The evaluation criteria have been expanded to include the "PM Peak Hour Percentage of Trucks." The evaluation of geometric deficiencies includes ramp design speeds, lane widths and ramp terminal design, which address stakeholder concerns. These factors are included in the evaluation criteria. Special attention was given to identifying land uses in the vicinity of the interchanges that would contribute to the level of truck operations, particularly truck service areas. Each individual "standard" or full study interchange report includes the identification of truck oriented land uses, geometric deficiencies and the PM peak hour percentage of trucks.

2.5 Capacity Analysis

The effectiveness of an interchange and all of its elements to serve existing or forecasted traffic levels that is determined through capacity studies. In this study, capacity studies were conducted for the following locations within each interchange:

Mainline approach to each interchange
Ramps located within each interchange
Ramp-freeway junctions (merge/diverge)
Ramp-street junctions (intersections)

The Highway Capacity Software Version 5.2 (HCS) was used for capacity analysis for mainline, ramps, ramp-freeway junctions, and weaving areas. Signalized and unsignalized intersections in this study were evaluated using Synchro Studio 7 software utilizing the HCM 2000 level of service calculations. Capacity analyses were performed for the highest volume locations for 2030 estimated traffic volumes for each of the "standard" interchanges.

Capacity analysis summaries are presented in each interchange report in the form shown below. The "Summary of Engineering Evaluation Criteria for Needs Prioritization" table found in Appendix E provides the weighted average for the future level of service for each interchange.

TRAFFIC OPERATIONS

2030 PM Peak Hour Capacity Analyses

I-64 Mainline – LOS D

Ramp Terminal – LOS E

Mainline Weaving Area – LOS E

Ramp Intersection – LOS C

Ramp Intersection – LOS D

2.6 Potential Interchange Improvements

Based on the deficiencies found in the engineering review and capacity analysis, planning level interchange improvements have been identified for each interchange under study. These potential improvements are formulated to address future (year 2030) conditions on the mainline, the ramps, and at intersections of interchange ramps with crossing roadways.

Potential improvements are categorized by typical improvement strategy, including: added lanes on ramp approaches, added lanes on the cross roads, added loop ramps at diamond interchanges, ramp removal at full cloverleaf interchanges, etc. Generally, the process used in identifying potential improvements was to identify the deficiency and test the application of increasingly costly treatments until a level of service D or better was achieved in an urban area or a level of service C or better was achieved in a rural area.

2.7 Cost Estimates

Estimated costs have been developed by category of typical improvement treatment for the Year 2007. No estimates for time of construction or for construction cost during a future year have been made. Cost estimates presented here should be considered as order of magnitude, pending more detailed engineering development. They reflect a planning level of detail and do not necessarily address unique site conditions at any particular location.

Cost estimates were based on year 2004 unit prices as developed in a cost estimating spreadsheet provided by INDOT Long Range Planning staff. The year 2004 costs were escalated to the year 2007 using a factor of 1.3. Table 2-3 provides a general summary of the cost categories used. These general categories were modified at some locations to reflect unique conditions.

Table 2-3. Estimated Construction Costs by Interchange Improvement Category

Typical Interchange Improvement Categories	2007 Estimated Cost	2007 Lower Cost Range	2007 Upper Cost Range
New Diamond Interchange (Rural)	$15,000,000	$14,000,000	$16,000,000
New Diamond Interchange or SPUI (Urban)	$22,000,000	$20,000,000	$24,000,000
Intersection Signalization and Minor Lane Improvements (1)	$250,000	$200,000	$300,000
Minor Lane Improvements to Signalized Intersection (1)	$200,000	$150,000	$250,000
Intersection Signalization and Minor Lane Improvements (2)	$450,000	$400,000	$500,000
Minor Lane Improvements to Signalized Intersection (2)	$400,000	$300,000	$500,000
Major Intersection Improvement with Signalization (1)	$1,200,000	$1,000,000	$1,400,000
Major Intersection Improvement with Signalization (2)	$2,100,000	$1,800,000	$2,400,000
Major Diamond Interchange Improvements (Signalization, added ramp lanes, ramp entrances and exits, added cross road lanes)	$12,000,000	$10,000,000	$14,000,000
Major Partial Cloverleaf Interchange Improvements- **Rural** (Signalization, added ramp lanes, ramp entrances and exits, added cross road lanes)	$18,000,000	$16,000,000	$20,000,000
Major Partial Cloverleaf Interchange Improvements - **Urban** (Signalization, added ramp lanes, ramp entrances and exits, added cross road lanes)	$26,000,000	$24,000,000	$28,000,000
Major Directional Interchange Improvements (multiple bridge widenings, added ramp lanes, ramp entrances and exits, added cross road lanes)	$30,000,000	$26,000,000	$34,000,000
Added lane to one ramp (each)	$1,300,000	$1,000,000	$1,600,000

2.8 Environmental Review

Potential impacts of improvements were evaluated based on aerial photography, site visits where turning movement counts were conducted, and review of available information. Specific land uses that could represent environmentally sensitive impacts were identified such as the following:

1. Potential Wetlands
2. Wooded areas
3. Parks or recreation areas
4. Potential Petroleum or other hazardous material storage, such as Auto/truck service stations, land fills, etc.
5. Churches, schools, hospitals or nursing homes
6. Residential Areas

3. PROCESS OVERVIEW FOR POTENTIAL NEW INTERCHANGES

Interchange reports have been developed to provide a summary of available information at each proposed interchange location. This information was used to conduct a systematic review of potential new interchange locations is provided to support decision making. This chapter provides an overview of key factors considered in this review.

To facilitate a systematic review of potential new locations, a summary matrix is used to present key information regarding the intended purpose of each interchange and its relationship to the factors described in this chapter. This matrix is provided with the summary of study recommendations in Chapter 6.

3.1 Potential New Interchanges Under Study

Nineteen potential new interchange locations were designated by INDOT for consideration in this study. Final review of the potential interchange indicated that four locations should be eliminated from full study. Two of the eliminated interchanges (I-065-249 & I-164-102) were identified as being included in the funded Major Moves program and should only be included in the 2030 Travel Demand Model. Two potential locations (US-050-022 & US-050-024) were identified as very close to the new I-69 corridor and should only be considered in the context of the I-69 design. The full study locations are listed in Table 3-1, and the interchanges eliminated are listed in Table 3-2.

Table 3-1. Full Study Potential New Interchange Locations

Interchange ID	Interchange Location	INDOT District	County	Interstate or Non-Interstate
I-065-098	I-65 & CR 750 N	Seymour	Johnson	Interstate
I-065-143	I-65 & CR 300 N (US 52 Relocation)	Crawfordsville	Boone	Interstate
I-069-012	I-69 & Cyntheanne Rd.	Greenfield	Hamilton	Interstate
I-069-118	I-69 & Gump/Hursh Rd.	Fort Wayne	Allen	Interstate
I-070-015	I-70 & Tabortown Rd.	Crawfordsville	Vigo County	Interstate
I-070-093	I-70 & German Church Rd.	Greenfield	Marion	Interstate
I-074-020	I-74 and SR 341	Crawfordsville	Fountain	Interstate
I-074-036	I-74 & SR 47	Crawfordsville	Montgomery	Interstate
I-074-136	I-74 & CR 80 NE / CR 200 E	Seymour	Decatur	Interstate
I-094-032	I-94 & County Line Rd.	Laporte	Laporte & Porter	Interstate
I164-012	I-164 & Millersburgh Rd.	Vincennes	Vanderburgh	Interstate
I865-002	I-865 & Cooper Rd.	Greenfield	Boone	Interstate
US30-063	US 30 & Pine Rd.	Laporte	Marshall	Non-Interstate
US-031-224	US 31 & Lincoln Highway	Laporte	Marshall	Non-Interstate
US-031-265	US 31 & Adams Rd.	Laporte	St. Joseph	Non-Interstate

Table 3-2. Potential New Interchange Location Eliminated from Full Study

Interchange ID	Interchange Location	INDOT District	County	Interstate or Non-Interstate
I-065-249	I-65 & 109th Street	Laporte	Lake	Interstate
I-164-102	I-164 & Gesthemane Rd.	Seymour	Harrison	Interstate
US-050-022	US 50 & SR 57	Vincennes	Daviess	Non-Interstate
US-050-024	US 50 & SR 257	Vincennes	Daviess	Non-Interstate

3.2 Local Coordination

Much of the information provided for potential new interchange locations was provided by local agencies. Questionnaires were distributed to solicit this input. These questionnaires were provided to local governments, plan commission staff, municipal and county leaders, INDOT district planning and development engineers, and others identified as having a specific interest in a particular interchange location. A contact list and sample questionnaire is provided in Appendix B.

There is a strong reliance on local input to provide the qualitative information needed to evaluate potential new interchanges. Key information provided by local agencies includes the intended purpose of the interchange, the existence of local and regional planning support, potential environmental constraints, and probable development impacts (positive and negative). In some cases, letters of support were provided. A total of 34 responses were received for the fifteen interchanges being reviewed. A range of 1 to 4 responses were received for each potential interchange.

3.3 Descriptive Data

Aerial photography was used in this study to identify the location and physical context for proposed interchanges. Other descriptive data includes traffic volumes (main line and cross road, if available), adjacent interchange service levels, distance to adjacent interchanges, and proposed layouts (if known).

The primary purpose of each proposed interchange is identified based on local and/or regional plans and input provided by local officials using the questionnaire developed for this project.

3.4 IPOC Selection Criteria for New Projects

The Indiana Department of Transportation has established the INDOT Planning Oversight Committee (IPOC) and has developed an analytical process for prioritizing major new transportation capacity investments. Both the organization and procedures of the IPOC process are defined in the document INDOT Planning Oversight Committee Protocols & Policies, Edition 1.1, November 29, 2005. The IPOC will use the procedures in this document to direct all INDOT funding for major new capacity projects. These are defined

as projects of $5 million or greater that increase mobility, provide connectivity, increase the accessibility of a region for economic development, increase the capacity of a transportation facility, or reduce congestion.

Any new interchange project, as well as many major interchange upgrade projects, is likely to fit the above definition of a major new capacity project. Because of this, the process used to prioritize potential new interchanges in the update to the Indiana Interchange Planning Study should be consistent with the project selection criteria presented in the November 29, 2005 IPOC document.

The IPOC document provides specific scoring procedures and values that are to be used in the investment decision process. Ideally, these procedures would be used during the Interchange Planning Study to calculate the IPOC score for each of the potential new interchanges. However, the use of a mathematical scoring process consistent with the IPOC process cannot be performed due to the lack of some information, the preliminary nature of the interchange proposals and the amount of analysis that would be required, which is beyond the scope of this study.

Consistency with the IPOC criteria has been evaluated for each proposed interchange using a qualitative review. In most cases, the IPOC criteria are already addressed in the qualitative review in the Interchange Planning Study. These include mobility, safety and economic development benefits of the proposed interchange.

Available information and qualitative assessment of the potential interchange locations are provided for the following IPOC Selection Criteria:

1. Transportation Efficiency Criteria
    a. Corridor Completion
    b. Road Classification
    c. Mobility (AADT)
    d. Mobility (V/C Ratio and LOS improvement)
    e. Intergovernmental Agreements
2. Safety Criteria
3. Economic Development Criteria
4. Customer Support
5. Non-INDOT Participation.
6. Urban Revitalization.

3.4 Federal Policy Review – Interstate Access

New Interstate access must comply with 23CFR630. Current federal policy regarding proposed new interchange locations was published in the Federal Register dated February 11, 1998 (Volume 63, Number 28). It provides the following information regarding the federal role:

"Section 111 of Title 23, U.S.C., provides that all agreements between the Secretary [of Transportation] and the state highway department for the construction of projects on the Interstate system shall contain a clause providing that the state will not add any points of access to, or exit from, the project in addition to those approved by the Secretary in the plans for such project, without the prior approval of the Secretary. The Secretary has delegated the authority to administer 23 U.S.C. 111 to the Federal Highway Administrator pursuant to 49 CFR 1.48(b)(10)."

Eight requirements are identified by FHWA policy for new or revised access to the Interstate System. These requirements are typically addressed in a site-specific interchange justification report that accompanies the request for access from the state highway department to the appropriate FHWA Division office. The topics of these eight requirements are listed and briefly paraphrased below:

1. Inadequacy of existing facilities to provide intended access.
2. Unavailability of reasonable design, location, and/or TSM alternatives.
3. Operational impacts on the existing Interstate facility.
4. Provision for all movements in accordance with current standards.
5. Consistency with local and regional land use and transportation plans.
6. Network studies where future multiple interchange additions may occur.
7. If driven by development, coordination with related system improvements.
8. Status of planning requirements and environmental process compliance.

A primary physical requirement for locating new interchanges is the impact on the existing Interstate System (item 3). This relates to spacing between interchanges. Although each potential interchange is ultimately analyzed for its specific effects, both FHWA and INDOT have developed spacing criteria to use as a guide in evaluating new locations. FHWA uses the guidelines provided by the American Association of State Highway and Transportation Officials (AASHTO) in the "A Policy on Geometric Design of Highway and Streets," commonly known as the "Green Book." INDOT standards are provided in Part V of the Road Design Manual (Section 48-1.04). The minimum criteria are shown below:

MINIMUM INTERCHANGE SPACING CRITERIA

	Urban	Rural
Interstate		
Federal (FHWA)	1.0 mile	2.0 miles
State (INDOT)	1.0 mile (2.0 miles desirable)	3.0 miles
Non-interstate		
State (INDOT)	1.0 mile	2.0 miles

It should be noted that the INDOT Road Design Manual recognizes that greater distances between interchanges generally improves freeway traffic operations and distances greater than minimums are desirable. Although exceptions are possible if it can be shown that impacts on the system can be minimized by installation of collector-distributor roads or other specialized design features, the inability of a proposed location to meet minimum interchange spacing criteria would constitute a fatal flaw.

The identification of "urban" versus "rural" conditions may or may not have a clear determination. The AASHTO Green Book states the following: "Urban areas are those places within boundaries set by the responsible State and local officials having a population of 5,000 or more." It goes on to say: "For design purposes, the population forecast for the design year should be used."

Reference is made in the AASHTO Green Book to Section 101 of Title 23, U.S. Code, which includes a reference to "Urban Areas" as defined by the U.S. Census and urbanized areas of 50,000 or more population, both subject to FHWA approval.

Based on the above considerations, each potential interchange was reviewed with respect to the eight requirements identified in current FHWA policy guidelines for an interchange justification report. Apparent strengths and fatal flaws were noted in each review.

3.5 Federal Policy Review – Environmental

In addition to the requirements of 23CFR630, new interchanges constitute a federal action and National Environmental Policy Act (NEPA) procedures must be followed. NEPA procedures are to be accomplished as part of the normal project development process and as a condition of final access approval. (Proposed access points can be submitted for a determination of engineering and operational acceptability prior to completion of the NEPA process.)

Based on the above considerations, the federal policy review for potential new interchanges includes a NEPA component. Observations are noted concerning potentially sensitive environmental issues based on aerial site reviews, existing studies and reports, and input from local officials. Apparent strengths and fatal flaws are noted in each review.

3.6 Local/Regional Planning Support

Ultimately, proposed new interchanges must consider and be consistent with local and regional land use and transportation plans, per requirement 5 of FHWA policy for Interstate access approval. Some projects are already included in local plans that have been officially adopted by the appropriate agencies.

Recognizing the value of local planning, this study identifies whether the proposed interchange concept originated in or has been driven by an existing community planning process that considers goals and objectives, regional development patterns, alternative transportation improvement options, and public input. The inclusion of the proposed interchange in local plans is noted, based on existing available information and

questionnaire responses from local officials. The type of transportation plan and the agency of adoption (if any) are identified.

3.7 Economic Development

Although economic development is not identified as a factor in federal guidelines, it can be a major positive consideration from a state and/or local perspective. This factor is largely qualitative and its review relies heavily on local input.

Descriptive information is provided for major economic developments related to each potential interchange location based on local input (if provided) and/or local and regional plans (if any). Endorsements and key supporting material provided in response to project questionnaires are listed in the interchange reports, and the most pertinent points with respect to potential economic development are summarized.

Since potential economic development opportunities are best defined by those directly involved, local agency contacts were identified for each interchange location based on primary jurisdictions affected. In many locations the local contacts included directors of county or city economic development agencies. Appendix B lists the local agency contacts that were sent questionnaires. Question 4 of the questionnaire requested the following:

> "4. Describe potential economic benefits associated with completion of the project (include benefits to job creation/retention, economic distress relief, tourism, commerce, etc. if applicable)."

Other items may be relevant to consider in evaluating and prioritizing new interchange locations. These may include local land use policies, funding availability, community or political support letters, and other factors. This supporting information is summarized, as appropriate, to reflect additional pertinent comments in local questionnaires and correspondence, or to identify significant conditions not covered in other review items.

4. INTERCHANGE SUMMARY DATA

In addition to this summary report for all interchanges and tables summarizing data for all interchanges, individual interchange summary data is a primary product of this project. Besides providing input into the needs priority system, the data gathered for this study establishes a focused and concise site-specific summary for each interchange subject to review. The accessibility of the study data has been greatly improved from prior studies. The 1990 study developed 3-ring binders for each interchange (approximately 250 binders) that contained printed documents including maps, report, traffic data, traffic analysis and other information. The 2002 study update included a printed summary report and electronic files distributed on a total of 12 compact disks (CD). The data included maps, aerial photography, individual interchange reports, traffic data, traffic analysis input files and other information. While the electronic data was an improvement over the printed binders, availability of the CD copies was limited. Engineers and planners who wanted access to the information often had to request it from the INDOT Long Range Planning unit.

The 2007 study update has developed a Web based GIS application that allows INDOT personnel to access the interchange data through GIS searches. This method of access will be especially beneficial from a mapping and interchange graphics perspective. While mapping in the previous studies was limited to a fixed printed scale, extent and content; the GIS interface will permit the user the ability to access data at a scale consistent with their needs. The Web based GIS will also allow INDOT to make this information readily available to greater number of staff whose job functions would benefit from the information, particularly in the district offices.

The interchange data content varies between existing "standard" interchanges, existing "limited study" interchanges and potential new interchanges, although some information is common. The data available for each type of interchange classification is described below.

4.1 Existing "Standard" Interchange Locations

An outline of the information developed for the existing interchange locations is presented here with a brief description of each item. Additional detail regarding data items is available in Chapter 2 and a description of the Web-based GIS application is presented later in this chapter.

This outline is intended to promote a general understanding of the information available for each interchange location and classification.

1.0 Interchange Report Summary (pdf file format)

Each interchange location will have a summary report that provides a brief summary of the technical data, analysis, ranking and recommendations associated with the interchange.

1.1. Summary

In a few paragraphs, an overview is provided regarding the interchange's location, context, service area, traffic demand, accident history and service level. Future needs and recommended improvements are described, and priority rating and ranking values are identified.

1.2. General Information

The interchange location, service area, and adjacent land use is described.

1.3. Engineering Evaluation

Inputs to the needs priority system are presented as descriptive data.

1.3.1. Accidents

Three-year (2003 – 2005) totals are presented for property damage, personal injury and fatal accidents.

1.3.2. Geometric Deficiencies

The number and type of deficiencies are identified with respect to current INDOT design standards.

1.3.3. Traffic Operations

Levels of service are reported for the locations used in the "needs" evaluation for future (2030) conditions during the evening peak periods. The locations typically include the main roadway mainline, ramp merges/diverge terminals, weaving sections and intersections consistent with the interchange configuration.

1.3.4. Truck Operations

Specific land use that would generate significant truck volumes in the interchange are identified and the PM peak hour percentage of trucks entering the interchange is identified, based on available existing truck volumes.

1.3.5. Environmental Review

Any known environmental issues related to the proposed improvement are identified.

1.3.6 Growth Potential

Growth factors (2000 – 2030) are provided for county population, employment, and households; and the estimated growth rate for average daily traffic is presented.

1.4. Priority Ranking

All input values are listed, and the associated interchange improvement rating and statewide ranking are identified.

1.5. Improvement Concepts

A representative set of improvements is identified, potential right of way and environmental issues are noted, and an estimated construction cost is provided.

2.0 Existing Link Traffic Summary Table (pdf file format)

Each Interchange location has a file that contains a summary of available "tube" count traffic data from the INDOT traffic counting program. For the "standard" full study interchanges, estimates from prior studies or other similar locations have been made where count data is missing.

3.0 Interchange Traffic Data

Each "standard" interchange location has a file (pdf file format) that contains a figure showing Year 2000 and Year 2030 PM peak hour traffic volumes for all interchange traffic movements, including a traffic diagram of the existing interchange configuration.

3.1 Highway Capacity Analysis

Each interchange location has Highway Capacity Software Version 5.2 (HCS) input files the capacity analysis of critical movements for mainline, ramps, ramp-freeway junctions, and weaving areas.

3.2 Synchro Version 7 traffic analysis

Each interchange location that has ramp terminal intersections has Synchro input files for interchange intersections

4.0 Interchange Geometric Deficiency Table (pdf file format)

Each "standard" interchange location has a file that contains a table showing the identification of the number and type of geometric deficiencies.

5.0 Potential Interchange Improvement Analysis

Interchanges that have identified traffic operation deficiencies include a planning level analysis of potential improvements that could achieve an acceptable level of service.

5.1 Highway Capacity Analysis

Each interchange location has Highway Capacity Software Version 5.2 (HCS) input files for the capacity analysis of potential improvements to locations that have less than a LOS D in urban areas or LOS C in rural areas.

5.2 Synchro Version 7 traffic analysis

Each interchange location that has ramp terminal intersections has Synchro input files for the capacity analysis of potential improvements to intersections that have less than a LOS D in urban areas or LOS C in rural areas.

4.2 Existing "Limited Study" Interchange Locations

Information developed for "Limited Study" interchanges is limited to data necessary for interchange screening process used to identify the "standard" or "full-study" interchanges.

1.0 Interchange Report Summary (pdf file format)

Each interchange location has a summary report that provides a brief summary of the technical data, analysis, and designation.

1.1. Interchange Designation

Identifies whether the interchange has experienced recent activity (currently under study, recently studied, or recently improved) or has low activity (low traffic volumes, low accident experience or low growth).

1.2. General Information

The interchange location, service area, and adjacent land use is described.

1.3. Engineering Evaluation

Inputs to the needs priority system are presented as descriptive data.

1.3.1. Accidents

Three-year (2003 – 2005) totals are presented for property damage, personal injury and fatal accidents.

1.3.2 Growth Potential

Growth factors (2000 - 2030) are provided for county population, employment, and households; and the estimated growth rate for average daily traffic is presented.

1.4. INDOT Study Results

If the interchange is classified as "recent activity", the type of activity is identified.

2.0 Existing Link Traffic Summary Table (pdf file format)

Each Interchange location has a file that contains a summary of available "tube" count traffic data from the INDOT traffic counting program.

4.3 Potential New Interchange Locations

The information available for potential new interchange locations is different from existing interchange locations, but the concept of providing available descriptive information on a site-specific basis is the same. The information available is consistent with the review factors described in Chapter 3. It is formatted to support a systemwide review of priorities.

An outline of the information developed for potential new interchange locations is presented here with a brief description of each item. Additional detail regarding data items is available in Chapter 2 and a description of the Web-based GIS application is presented later in this chapter.

1.0 Interchange Report Summary (pdf file format)

Each interchange location has a summary report that provides a brief summary of the intended purpose of the interchange, technical data and analyses.

1.1. Summary Data

Descriptive information related to the potential interchange is provided in the form of brief statements or tabulations.

1.1.1 Purpose

Based primarily on local input, the purpose of the interchange is identified as 1) to benefit the Interstate System, 2) to benefit the local roadway system, and/or 3) to enhance economic development. All potential new interchanges fall within one or more of these categories.

1.1.2 Proposed Layout

An assumed interchange type is identified (diamond, compressed diamond, single point diamond, partial cloverleaf, or directional), and a representative construction cost estimate is presented.

1.1.3 Adjacent Interchanges

Adjacent interchanges and their distance from the potential new interchange location are identified.

1.2 Traffic Data

Existing and forecasted daily traffic volumes are tabulated for the Interstate main line and for the crossing roadway (where available).

1.3 Level of Service

Existing and forecasted levels of service are listed for adjacent interchange locations.

1.4 Project Review Factors

Summary statements are presented for each of the project review factors considered for potential new interchange locations, including IPOC Selection Criteria.

1.5 Federal Policy Review – Interstate Access Only

Each of the eight items required by FHWA for an interchange justification report are discussed in this section, followed by a summary statement regarding the federal policy interstate access review.

1.6 Federal Policy Review -- Environmental

Based on available information, observations are provided with respect to land use/relocations, wetlands/floodplains, park land, potential historic

structures, and environmental justice issues. A statement is provided summarizing the federal policy environmental review.

1.7 Local/Regional Planning Support

Planning support (or lack of planning support) for the potential interchange is described. In urbanized areas, this review includes MPO as well as local plans. A project is deemed to have planning support if it is adopted by an appropriate agency following a process involving community goals and objectives, alternatives review, and public involvement. A summary statement is provided regarding planning support.

1.8 Coordination and Questionnaire Contacts

Names and contact information are listed for each individual provided with a questionnaire for input into this study.

1.9 Other Factors

Discussion is provided to describe any additional factors not included elsewhere in the report and to note any specific comments, particularly from INDOT district representatives that should be considered.

2.0 Existing Link Traffic Summary Table (pdf file format)

Each interchange location has files that contain a summary of available "tube" count traffic data from the INDOT traffic counting program.

3.0 Interchange Traffic Data

Each potential new interchange location has a file (pdf file format) that contains a figure showing 2030 PM peak hour traffic volumes for all interchange traffic movements, including traffic diagrams of potential interchange configurations.

3.1 Highway Capacity Analysis

Each interchange location has Highway Capacity Software Version 5.2 (HCS) input files for the capacity analysis of mainline, ramps, ramp-freeway junctions, and weaving areas that by inspection may exhibit a LOS less than C.

3.2 Synchro Version 7 traffic analysis

Potential interchange configurations that have ramp terminal intersections have Synchro input files for interchange intersections.

4.4 INDOT Interchange Study Viewer

A Web based GIS application has been developed for implementation on the INDOT Intranet. The application provides a GIS based graphical interface for accessing mapping information, aerial images and interchange data produced by this study for each interchange location. The application provides the following functional capabilities:

1. Search Data
    a. Spatial Selection Search
        i. Interchange Node
        ii. Crash Data Buffer
    b. Attribute Search
        i. Highway
        ii. Crossroad
        iii. INDOT District
        iv. MPO
        v. Study Category
        vi. County Name
        vii. Evaluation Data
            1. Accident Severity Index
            2. Accident Rate
            3. Future Level of Service
            4. Future ADT
            5. Number of Geometric Deficiencies
            6. Priority Ranking

2. Map Interaction
    a. Zoom In
    b. Zoom Out
    c. Zoom to Full Extent
    d. Zoom to Selected
    e. Pan
    f. Overview Map
    g. Select
    h. Active Layer

3. Document Access
    a. Interchange Report Summary
    b. Existing Traffic
    c. Future Traffic
    d. Interchange Geometric Deficiencies
    e. Improvements

4. Additional Map Information
    a. Right-of-way footprint for potential new interchange locations

A GIS application user (User) would access the Interchange Study viewer through the INDOT Intranet. After accessing the Interchange Study viewer the user would perform a search or query to identify a specific interchange location geographically or the user would specify attribute data related to the desired information. For example if the user wanted to find interchanges on I-70 in Vigo County, he or she would select those search values and the GIS viewer would focus or zoom to all of the interchanges located on I-70 in Vigo County. The user could then select a specific interchange so that documents related to that specific interchange could be accessed. Documents could then be viewed or downloaded as appropriate for the information desired.

The right-of-way footprints for potential new interchange locations has been developed to contain a very "high-type" interchange design. Right-of-way requirements could be significantly less based on a more detailed study and design development.

Since the underlying graphics and documents are readily available to the INDOT Intranet systems operator, they can be easily updated with new information or other GIS related data.

5. INTERCHANGE NEEDS PRIORITIZATION

In support of this study, a decision-making methodology was developed for prioritizing the existing interchanges in terms of their relative need for improvement. The methodology includes the following steps:

1. Expressing all evaluation data in relative quantitative format
2. Normalizing or scaling the evaluation results (data) within each evaluation criteria to a number between 0 (best performing) and 1 (worst performing).
3. Applying a weighting factor that expresses the relative importance of each evaluation criteria and again, normalizing or scaling the resulting data values between 0 and 1.

This methodology allows the comparison of interchange performance with a variety of evaluation factors that do not have a common measure of performance. Based on the methodology used in the previous studies, decision criteria have been established to indicate the relative measure of performance for each of the evaluation factors. These are listed below:

DECISION CRITERIA

1. Accident Severity =
   (NUMBER OF PROPERTY DAMAGE ONLY ACCIDENTS * 1) +
   (NUMBER OF PERSONAL INJURY ACCIDENTS * 2) +
   (NUMBER OF FATAL ACCIDENTS * 4)

2. Accident Rate =
   Accident Severity / Existing ADT Entering Interchange / 1,000,000 vehicles

3. 2030 Average Daily Traffic (ADT) Entering Interchange from all approaches

4. Future Level-of-Service =
   (Weight of LOS for Weaving Area +
   Weight of LOS for Interstate Mainline +
   Weight of LOS for Ramps +
   Weight of LOS for Ramp Terminal-Crossroad Intersections) /
   Number of LOS locations
   Where, Weight of LOS A-C =1
   Weight of LOS D = 2
   Weight of LOS E = 4
   Weight of LOS F = 8

5. PM Peak Hour Percentage of Trucks

6. Geometric Deficiencies
   Total Number of Geometric Deficiencies including mainline, ramps, intersections and crossroad

7. Interchange Growth Rate
2030 ADT Entering Interchange / 2000 ADT Entering Interchange

WEIGHTING VALUES FOR EVALUATION CRITERIA

Criteria	Priority	Weight Values	Normalized Weights
Accident Severity Index	higher value, higher priority	5.0	.1064
Accident Rate	higher value, higher priority	5.0	.1064
2030 ADT using Interchange	higher value, higher priority	8.0	.1702
Future Level-of-Service	higher value, higher priority	9.5	.2021
Number of Geometric Deficiencies	higher value, higher priority	8.0	.1702
Percentage Trucks	lower value, higher priority	4.5	.0957
Interchange Growth Rate	higher value, higher priority	7.0	.1489

Example using Level of Service and Accident Severity for Interchange I-1

The Future Level-of-Service (FLOS) is a measure of traffic operations performance associated with a letter grade A, B, C, D, E, or F; where A is the best performing and F is the worst performing. The Accident Severity Index (ASI) is a measure of performance related to the number of accidents occurring within the influence area of an interchange as well as a measure of severity (property damage only, personal injury and personal injury resulting in a fatality). The range of values for accident severity could be from 0 to the highest value for any interchange studied.

The FLOS of a particular interchange will have a value between 1 and 8, where 1 indicates that all interchange traffic analysis locations have a FLOS from A to C and 8 indicates that all interchange traffic analysis locations have a FLOS of F. The ASI is calculated from the number of accidents and the severity weights shown in item 1 above. The normalized or scaled values for both are calculated from the formula:

$$SV = [1 / (HV - LV)] \times (MV - LV)$$

Where:

SV = Scaled (Normalized) Value of performance factor for the specific interchange being evaluated

HV = Highest Value for this performance factor of all of the interchanges evaluated

LV = Lowest Value for this performance factor of all of the interchanges evaluated

MV = Measured Value for this performance factor for the specific interchange being evaluated

Assuming the following values for the set (full study) interchanges being evaluated and the example interchange I-1:

MV LOS = 6, LV LOS = 1, HV LOS = 8
MV ASI = 114, LV ASI = 1, HV ASI = 337

Comparing directly the measured value for level of service (MV LOS) of 6 with the measured value for the Accident Severity Index (MV ASI) of 120 would skew the result significantly. Using the scaled or normalized approach would generate a SV LOS = 0.714 and the SV ASI = 0.339, a much different comparison. The scaled values are then adjusted further with weighting factor that has been scaled or normalized, producing a total weighted score between 0 and 1.

5.1 Evaluation of Interchanges

All 122 interchanges were evaluated with respect to the seven criteria. The results are tabulated as shown in Table 5-1. Table 5-2 shows the same evaluation results following the scaling or normalizing process.

Table 5-1. Interchange Evaluation Values

Existing "Standard" Interchange Evaluation - Evaluation Values								
Interchange ID	Crossroad	Accident Severity	Accident Rate	Future LOS	Future ADT	PMPH % Trucks	Geometric Deficiency	Growth Rate
I-064-025	US 41	57	46	1.0	80,000	40%	21	1.13
I-064-039	SR 61	50	133	1.0	25,000	23%	15	1.27
I-064-079	SR 37(S)	8	22	1.0	21,000	39%	15	1.39
I-064-086	SR 37(N) / SR 66(S)	50	137	1.0	79,991	40%	21	1.4
I-064-105	SR 135	99	91	4.5	63,000	21%	10	1.37
I-064-119	US 150	72	54	8.0	25,000	23%	15	1.34
I-065-016	Memphis - Bluelick	63	69	4.5	90,000	24%	11	1.34
I-065-019	SR 160	53	61	2.8	68,000	27%	16	1.35
I-065-029	SR 56	82	75	1.0	105,000	34%	17	1.34
I-065-036	US 31	61	74	1.0	50,000	27%	21	1.34
I-065-049	US 50	69	53	2.0	21,000	39%	33	1.34
I-065-076	US 31	127	113	1.0	20,000	37%	10	1.34
I-065-090	SR 44	99	78	5.5	100,000	23%	13	1.32
I-065-106	I-465	227	55	8.0	340,000	7%	28	1.34
I-065-107	Keystone / (Old SR 431)	167	82	4.5	63,000	21%	11	1.33
I-065-109	Raymond	301	123	4.5	123,000	6%	34	1.33
I-065-112B	I-70(N)	284	66	8.0	296,000	7%	48	1.36
I-065-113	Pennsylvania / Meridian/Delaware	332	103	4.5	94,000	9%	27	1.42
I-065-114	West	62	22	5.7	166,000	4%	9	1.53
I-065-115	21st St	174	70	5.3	164,000	7%	23	1.47
I-065-117	MLKJr	145	91	4.8	150,000	9%	24	1.46
I-065-123	I-465	159	52	4.5	210,000	11%	21	1.35
I-065-124	71st	31	26	5.5	79,000	14%	18	1.39
I-065-146	SR 47	17	18	4.5	74,000	27%	15	1.32
I-065-168	SR 38	100	70	1.0	89,000	28%	6	1.27
I-065-175	SR 25	141	111	2.0	92,000	23%	15	1.27
I-065-178	SR 43	181	163	4.8	82,000	28%	15	1.23
I-065-215	SR 114	44	56	4.5	54,000	34%	11	1.27
I-065-230	SR 10	44	50	4.5	52,000	32%	2	1.27
I-065-240	SR 2	136	138	4.5	71,000	26%	6	1.26
I-065-247	US 231	178	177	4.5	105,000	34%	8	1.22
I-069-014	SR 13	68	63	7.0	88,000	13%	12	1.25
I-069-019	SR 38	76	67	5.5	50,000	27%	12	1.34
I-069-022	SR 9 / SR 67	50	37	1.8	94,000	17%	19	1.33
I-069-026	SR 109 / SR 9	161	108	3.0	83,000	19%	15	1.4
I-069-034	SR 67 / SR 32	80	62	2.3	98,000	15%	28	1.29
I-069-041	SR 332	53	57	4.5	75,000	19%	8	1.4
I-069-045	US 35 / SR 28	41	50	4.5	61,000	27%	13	1.35
I-069-055	SR 26	22	32	1.0	54,000	29%	15	1.43
I-069-059	SR 22 / US 35	50	58	1.0	61,000	30%	11	1.57
I-069-064	SR 18	43	55	2.8	100,000	23%	13	1.34
I-069-105	SR 14	95	48	5.7	146,000	24%	20	1.32
I-069-109	US 30 / US 33	337	177	5.7	126,000	12%	18	1.36
I-069-111	SR 3 / US 27	194	86	8.0	140,000	12%	25	1.32

Table 5-1. Interchange Evaluation Values, cont.

Existing "Standard" Interchange Evaluation - Evaluation Values								
Interchange ID	Crossroad	Accident Severity	Accident Rate	Future LOS	Future ADT	PMPH % Trucks	Geometric Deficiency	Growth Rate
I-069-126	CR11A	42	50	2.0	58,000	22%	15	1.32
I-069-129	SR 8	176	157	1.0	85,000	21%	11	1.31
I-069-134	US 6	50	67	1.0	62,000	21%	20	1.38
I-069-150	CR200W	12	19	1.0	132,000	6%	13	1.3
I-069-154	SR 127 / SR 727	34	56	2.8	37,000	21%	21	1.21
I-070-023	SR 59	67	73	1.0	55,000	41%	10	1.21
I-070-041	US 231	47	43	1.3	68,000	28%	7	1.4
I-070-051	CR1100W / County Rd.1100 West	15	17	1.0	55,000	30%	15	1.34
I-070-059	SR 39	57	50	5.0	70,000	27%	4	1.2
I-070-066	SR 267	210	131	8.0	137,000	22%	15	1.35
I-070-075	AirportExpwy	36	18	6.0	138,000	12%	21	1.27
I-070-077	Holt	139	64	6.3	141,000	11%	18	1.21
I-070-078	Harding	61	27	2.0	147,000	11%	15	1.28
I-070-079a	West	90	34	8.0	165,000	28%	24	1.19
I-070-079b	Capitol / Illinois	137	52	6.0	125,000	31%	20	1.32
I-070-079c	McCarty / Pennsylvania/Madison	69	22	8.0	133,000	31%	26	1.23
I-070-115	SR 109	61	72	3.0	62,000	35%	9	1.21
I-070-123	SR 3	102	108	1.0	80,000	35%	16	1.25
I-070-137	SR 1	18	23	2.8	71,000	29%	3	1.31
I-070-149	US 35 / Willamsburg Pike	87	93	1.0	71,000	28%	21	1.21
I-074-004	SR 63	27	53	4.5	38,000	35%	13	1.15
I-074-034	US 231	44	71	1.8	60,000	41%	19	1.11
I-074-039	SR 32	34	74	1.8	45,000	39%	7	1.12
I-074-058	SR 39	10	23	4.5	51,000	30%	12	1.15
I-074-061	CR275E	28	59	4.5	54,000	16%	15	1.27
I-074-066	SR 267	143	146	6.5	160,000	16%	14	1.28
I-074-109	Fairland	29	41	1.0	50,000	18%	15	1.28
I-074-113	SR 9	42	47	4.5	68,000	20%	18	1.32
I-074-134	SR 3	21	31	1.0	44,000	20%	22	1.41
I-074-149	SR 229	27	29	1.0	53,000	31%	16	1.35
I-074-164	SR 1	39	62	4.5	44,000	21%	12	1.36
I-074-169	US 52	25	36	2.8	47,000	18%	11	1.4
I-080-015	US 6 / SR 51	144	93	1.0	148,000	22%	15	1.29
I-080-016	I-94	43	25	2.0	133,000	26%	15	1.05
I-094-019	SR 249	116	66	4.5	100,000	24%	22	1.44
I-094-022	US 20	47	28	1.0	104,000	26%	9	1.32
I-094-026	SR 49	62	35	1.0	77,000	19%	25	1.51
I-094-034	US 421	42	38	1.0	78,000	16%	26	1.31
I-094-040	US 20	38	35	1.0	92,000	40%	29	1.15
I-164-005	SR 662	63	79	1.8	71,000	6%	15	1.23
I-164-009	SR 62	40	49	2.3	82,000	8%	15	1.64
I-265-001	State	206	136	6.3	121,000	5%	21	1.18
I-265-003	SR 111	206	129	8.0	141,000	4%	20	1.39
I-265-004	SR 311	147	99	3.3	109,000	4%	14	1.24

Table 5-1. Interchange Evaluation Values, cont.

Existing "Standard" Interchange Evaluation - Evaluation Values								
Interchange ID	Crossroad	Accident Severity	Accident Rate	Future LOS	Future ADT	PMPH % Trucks	Geometric Deficiency	Growth Rate
I-265-009	SR 62	17	27	3.3	94,000	4%	15	1.24
I-275-016	US 50	4	3	1.5	76,000	11%	15	1.46
I-465-002	US 31 / Meridian	165	56	8.0	261,000	12%	31	1.35
I-465-007	Mann	116	58	7.0	181,000	13%	9	1.38
I-469-029	Maplecrest	21	23	3.5	70,000	11%	15	1.24
SR-002-039	SR 49	114	212	4.5	67,000	11%	12	1.23
SR-023-039	SR 933 / Lincolnway	27	26	3.3	51,000	7%	14	1.2
SR-062-020	University Blvd. / Eickhoff Rd.	91	94	1.3	74,000	4%	9	1.22
SR-062-024	Barker Ave.	9	12	4.5	110,000	5%	12	0.84
SR-062-026	Main St.	36	39	1.0	98,000	5%	15	1.26
SR-062-027	Garvin St.	82	95	1.5	111,000	5%	15	1.26
US-020-008	Kennedy Ave.	99	151	5.3	36,000	5%	6	1.29
US-020-010	SR 912 / Michigan St.	142	97	4.3	78,000	6%	10	1.27
US-020-079	US 31 / US 31 Extention	16	12	1.0	70,000	13%	8	1.61
US-020-082	Ironwood Rd.	1	1	3.3	61,000	11%	1	1.55
US-020-084	SR 331 / Bremen Hwy.	15	18	2.8	63,000	11%	4	1.31
US-020-093	SR 19	1	1	1.5	68,000	12%	8	1.34
US-020-096	US 33 / SR 933	2	2	1.8	61,000	13%	6	1.34
US-020-099	IR-17	184	263	4.5	49,000	13%	15	1.29
US-030-065	SR 17 / Michigan St.	90	145	4.5	44,000	33%	6	1.33
US-030-090	SR 15	84	94	3.0	53,000	41%	4	1.32
US-031-073	Indianapolis Ave. / Old SR 11	87	228	1.5	65,000	5%	15	1.35
US-031-212	SR 25	45	118	3.5	38,000	13%	6	1.38
US-035-041	SR 3 / SR 67	14	35	1.0	24,000	10%	12	1.36
US-041-005	SR 66 / Diamond Ave	39	29	2.0	99,000	0%	15	1.23
US-041-054	Hart St.	63	161	1.0	35,000	15%	11	1.24
US-041-056	SR 61 / US 50	35	52	1.0	41,000	14%	15	1.31
US-041-058	SR 67 / Co. Rd.	11	24	1.0	20,000	11%	11	1.39
US-041-114	SR 63	17	18	1.0	38,000	12%	15	1.3
US-041-273	State St. / Sibley St.	78	129	1.3	32,000	0%	15	1.3
US-041-276	SR 912	86	148	4.5	101,000	5%	15	1.35
US-050-065	SR 37 / Old US 50	72	123	1.0	34,000	5%	22	1.58
US-052-043	US 231	155	237	2.5	63,000	2%	15	1.39
US-052-044	SR 443 / Soldiers Home Rd.	12	15	2.8	59,000	2%	15	1.21

Table 5-2. Interchange Evaluation Values – Scaled or Normalized

Existing "Standard" Interchange Evaluation - Scaled (normalized) Evaluation Values								
Interchange ID	Crossroad	Accident Severity	Accident Rate	Future LOS	Future ADT	PMPH % Trucks	Geometric Deficiency	Growth Rate
I-064-025	US 41	0.1667	0.1711	0.0000	0.1875	0.9665	0.4255	0.3625
I-064-039	SR 61	0.1458	0.5035	0.0000	0.0156	0.5710	0.2979	0.5375
I-064-079	SR 37(S)	0.0208	0.0781	0.0000	0.0031	0.9435	0.2979	0.6875
I-064-086	SR 37(N) / SR 66(S)	0.1458	0.5201	0.0000	0.1875	0.9720	0.4255	0.7000
I-064-105	SR 135	0.2917	0.3428	0.5000	0.1344	0.5103	0.1915	0.6625
I-064-119	US 150	0.2113	0.2027	1.0000	0.0156	0.5589	0.2979	0.6250
I-065-016	Memphis - Bluelick	0.1845	0.2591	0.5000	0.2188	0.5761	0.2128	0.6250
I-065-019	SR 160	0.1548	0.2286	0.2500	0.1500	0.6588	0.3191	0.6375
I-065-029	SR 56	0.2411	0.2827	0.0000	0.2656	0.8249	0.3404	0.6250
I-065-036	US 31	0.1786	0.2791	0.0000	0.0938	0.6561	0.4255	0.6250
I-065-049	US 50	0.2024	0.1972	0.1429	0.0031	0.9477	0.6809	0.6250
I-065-076	US 31	0.3750	0.4250	0.0000	0.0000	0.8991	0.1915	0.6250
I-065-090	SR 44	0.2917	0.2938	0.6429	0.2500	0.5686	0.2553	0.6000
I-065-106	I-465	0.6726	0.2057	1.0000	1.0000	0.1701	0.5745	0.6250
I-065-107	Keystone / (Old SR 431)	0.4940	0.3095	0.5000	0.1344	0.5103	0.2128	0.6125
I-065-109	Raymond	0.8929	0.4640	0.5000	0.3219	0.1395	0.7021	0.6125
I-065-112B	I-70(N)	0.8423	0.2468	1.0000	0.8625	0.1583	1.0000	0.6500
I-065-113	Pennsylvania / Meridian/Delaware	0.9851	0.3869	0.5000	0.2313	0.2187	0.5532	0.7250
I-065-114	West	0.1815	0.0806	0.6667	0.4563	0.1019	0.1702	0.8625
I-065-115	21st St	0.5149	0.2640	0.6071	0.4500	0.1580	0.4681	0.7875
I-065-117	MLKJr	0.4286	0.3431	0.5357	0.4063	0.2187	0.4894	0.7750
I-065-123	I-465	0.4702	0.1947	0.5000	0.5938	0.2653	0.4255	0.6375
I-065-124	71st	0.0893	0.0932	0.6429	0.1844	0.3431	0.3617	0.6875
I-065-146	SR 47	0.0476	0.0629	0.5000	0.1688	0.6650	0.2979	0.6000
I-065-168	SR 38	0.2946	0.2638	0.0000	0.2156	0.6809	0.1064	0.5375
I-065-175	SR 25	0.4167	0.4174	0.1429	0.2250	0.5663	0.2979	0.5375
I-065-178	SR 43	0.5357	0.6160	0.5357	0.1938	0.6804	0.2979	0.4875
I-065-215	SR 114	0.1280	0.2108	0.5000	0.1063	0.8180	0.2128	0.5375
I-065-230	SR 10	0.1280	0.1875	0.5000	0.1000	0.7739	0.0213	0.5375
I-065-240	SR 2	0.4018	0.5238	0.5000	0.1594	0.6373	0.1064	0.5250
I-065-247	US 231	0.5268	0.6692	0.5000	0.2656	0.8262	0.1489	0.4750
I-069-014	SR 13	0.1994	0.2349	0.8571	0.2125	0.3180	0.2340	0.5125
I-069-019	SR 38	0.2232	0.2529	0.6429	0.0938	0.6561	0.2340	0.6250
I-069-022	SR 9 / SR 67	0.1458	0.1358	0.1071	0.2313	0.4021	0.3830	0.6125
I-069-026	SR 109 / SR 9	0.4762	0.4073	0.2857	0.1969	0.4525	0.2979	0.7000
I-069-034	SR 67 / SR 32	0.2351	0.2322	0.1786	0.2438	0.3728	0.5745	0.5625
I-069-041	SR 332	0.1548	0.2125	0.5000	0.1719	0.4581	0.1489	0.7000
I-069-045	US 35 / SR 28	0.1190	0.1877	0.5000	0.1281	0.6514	0.2553	0.6375
I-069-055	SR 26	0.0625	0.1171	0.0000	0.1063	0.7013	0.2979	0.7375
I-069-059	SR 22 / US 35	0.1458	0.2166	0.0000	0.1281	0.7392	0.2128	0.9125
I-069-064	SR 18	0.1250	0.2062	0.2500	0.2500	0.5589	0.2553	0.6250
I-069-105	SR 14	0.2798	0.1801	0.6667	0.3938	0.5722	0.4043	0.6000
I-069-109	US 30 / US 33	1.0000	0.6699	0.6667	0.3313	0.3007	0.3617	0.6500
I-069-111	SR 3 / US 27	0.5744	0.3228	1.0000	0.3750	0.3007	0.5106	0.6000

Table 5-2. Interchange Evaluation Values – Scaled or Normalized, cont.

Existing "Standard" Interchange Evaluation - Scaled (normalized) Evaluation Values								
Interchange ID	Crossroad	Accident Severity	Accident Rate	Future LOS	Future ADT	PMPH % Trucks	Geometric Deficiency	Growth Rate
I-069-126	CR11A	0.1220	0.1872	0.1429	0.1188	0.5340	0.2979	0.6000
I-069-129	SR 8	0.5208	0.5933	0.0000	0.2031	0.5103	0.2128	0.5875
I-069-134	US 6	0.1458	0.2517	0.0000	0.1313	0.5145	0.4043	0.6750
I-069-150	CR200W	0.0327	0.0668	0.0000	0.3500	0.1458	0.2553	0.5750
I-069-154	SR 127 / SR 727	0.0982	0.2112	0.2500	0.0531	0.5191	0.4255	0.4625
I-070-023	SR 59	0.1964	0.2746	0.5357	0.1094	0.9842	0.1915	0.4625
I-070-041	US 231	0.1369	0.1599	0.0357	0.1500	0.6722	0.1277	0.7000
I-070-051	CR1100W / County Rd.1100 West	0.0417	0.0622	0.0000	0.1094	0.7313	0.2979	0.6250
I-070-059	SR 39	0.1667	0.1848	0.7857	0.1563	0.6620	0.0638	0.4500
I-070-066	SR 267	0.6220	0.4939	1.0000	0.3656	0.5376	0.2979	0.6375
I-070-075	AirportExpwy	0.1042	0.0653	0.7143	0.3688	0.2892	0.4255	0.5375
I-070-077	Holt	0.4107	0.2381	0.7500	0.3781	0.2758	0.3617	0.4625
I-070-078	Harding	0.1786	0.0999	0.3571	0.3969	0.2685	0.2979	0.5500
I-070-079a	West	0.2649	0.1250	1.0000	0.4531	0.6906	0.4894	0.4375
I-070-079b	Capitol / Illinois	0.4048	0.1924	0.4286	0.3281	0.7533	0.4043	0.6000
I-070-079c	McCarty / Pennsylvania/Madison	0.2024	0.0807	1.0000	0.3531	0.7533	0.5319	0.4875
I-070-115	SR 109	0.1786	0.2689	0.2857	0.1313	0.8480	0.1702	0.4625
I-070-123	SR 3	0.3006	0.4070	0.0000	0.1875	0.8463	0.3191	0.5125
I-070-137	SR 1	0.0506	0.0829	0.2500	0.1594	0.7052	0.0426	0.5875
I-070-149	US 35 / Willamsburg Pike	0.2560	0.3501	0.0000	0.1594	0.6906	0.4255	0.4625
I-074-004	SR 63	0.0774	0.1982	0.5000	0.0563	0.8443	0.2553	0.3875
I-074-034	US 231	0.1280	0.2666	0.1071	0.1250	0.9910	0.3830	0.3375
I-074-039	SR 32	0.0982	0.2790	0.1071	0.0781	0.9489	0.1277	0.3500
I-074-058	SR 39	0.0268	0.0853	0.5000	0.0969	0.7240	0.2340	0.3875
I-074-061	CR275E	0.0804	0.2206	0.5000	0.1063	0.3907	0.2979	0.5375
I-074-066	SR 267	0.4226	0.5519	0.7857	0.4375	0.3907	0.2766	0.5500
I-074-109	Fairland	0.0833	0.1527	0.0000	0.0938	0.4345	0.2979	0.5500
I-074-113	SR 9	0.1220	0.1760	0.5000	0.1500	0.4946	0.3617	0.6000
I-074-134	SR 3	0.0595	0.1134	0.0000	0.0750	0.4822	0.4468	0.7125
I-074-149	SR 229	0.0774	0.1057	0.0000	0.1031	0.7550	0.3191	0.6375
I-074-164	SR 1	0.1131	0.2331	0.5000	0.0750	0.5054	0.2340	0.6500
I-074-169	US 52	0.0714	0.1325	0.2500	0.0844	0.4477	0.2128	0.7000
I-080-015	US 6 / SR 51	0.4256	0.3492	0.0000	0.4000	0.5346	0.2979	0.5625
I-080-016	I-94	0.1250	0.0909	0.1429	0.3531	0.6226	0.2979	0.2625
I-094-019	SR 249	0.3423	0.2457	0.5000	0.2500	0.5760	0.4468	0.7500
I-094-022	US 20	0.1369	0.1035	0.0000	0.2625	0.6310	0.1702	0.6000
I-094-026	SR 49	0.1815	0.1284	0.0000	0.1781	0.4695	0.5106	0.8375
I-094-034	US 421	0.1220	0.1415	0.0000	0.1813	0.3793	0.5319	0.5875
I-094-040	US 20	0.1101	0.1295	0.0000	0.2250	0.9675	0.5957	0.3875
I-164-005	SR 662	0.1845	0.2970	0.1071	0.1594	0.1563	0.2979	0.4875
I-164-009	SR 62	0.1161	0.1830	0.1786	0.1938	0.2018	0.2979	1.0000
I-265-001	State	0.6101	0.5128	0.7500	0.3156	0.1127	0.4255	0.4250
I-265-003	SR 111	0.6101	0.4874	1.0000	0.3781	0.1072	0.4043	0.6875
I-265-004	SR 311	0.4345	0.3750	0.3214	0.2781	0.0972	0.2766	0.5000

Table 5-2. Interchange Evaluation Values – Scaled or Normalized, cont

Existing "Standard" Interchange Evaluation - Scaled (normalized) Evaluation Values								
Interchange ID	Crossroad	Accident Severity	Accident Rate	Future LOS	Future ADT	PMPH % Trucks	Geometric Deficiency	Growth Rate
I-265-009	SR 62	0.0476	0.0998	0.3333	0.2313	0.1039	0.2979	0.5000
I-275-016	US 50	0.0089	0.0091	0.0714	0.1750	0.2714	0.2979	0.7750
I-465-002	US 31 / Meridian	0.4881	0.2090	1.0000	0.7531	0.2986	0.6383	0.6375
I-465-007	Mann	0.3423	0.2164	0.8571	0.5031	0.3117	0.1702	0.6750
I-469-029	Maplecrest	0.0595	0.0829	0.3571	0.1563	0.2610	0.2979	0.5000
SR-002-039	SR 49	0.3363	0.8051	0.5000	0.1469	0.2772	0.2340	0.4875
SR-023-039	SR 933 / Lincolnway	0.0774	0.0953	0.3333	0.0969	0.1701	0.2766	0.4500
SR-062-020	University Blvd. / Eickhoff Rd.	0.2679	0.3547	0.0357	0.1688	0.0947	0.1702	0.4750
SR-062-024	Barker Ave.	0.0238	0.0414	0.5000	0.2813	0.1215	0.2340	0.0000
SR-062-026	Main St.	0.1042	0.1439	0.0000	0.2438	0.1215	0.2979	0.5250
SR-062-027	Garvin St.	0.2411	0.3577	0.0714	0.2844	0.1215	0.2979	0.5250
US-020-008	Kennedy Ave.	0.2917	0.5713	0.6071	0.0500	0.1215	0.1064	0.5625
US-020-010	SR 912 / Michigan St.	0.4196	0.3650	0.4762	0.1813	0.1337	0.1915	0.5375
US-020-079	US 31 / US 31 Extention	0.0446	0.0399	0.0000	0.1563	0.3052	0.1489	0.9625
US-020-082	Ironwood Rd.	0.0000	0.0000	0.3333	0.1281	0.2635	0.0000	0.8875
US-020-084	SR 331 / Bremen Hwy.	0.0417	0.0635	0.2500	0.1344	0.2578	0.0638	0.5875
US-020-093	SR 19	0.0000	0.0002	0.0714	0.1500	0.2981	0.1489	0.6250
US-020-096	US 33 / SR 933	0.0030	0.0036	0.1071	0.1281	0.3204	0.1064	0.6250
US-020-099	IR-17	0.5446	1.0000	0.5000	0.0906	0.3159	0.2979	0.5625
US-030-065	SR 17 / Michigan St.	0.2649	0.5498	0.5000	0.0750	0.8131	0.1064	0.6125
US-030-090	SR 15	0.2470	0.3556	0.2857	0.1031	1.0000	0.0638	0.6000
US-031-073	Indianapolis Ave. / Old SR 11	0.2560	0.8648	0.0714	0.1406	0.1137	0.2979	0.6375
US-031-212	SR 25	0.1310	0.4470	0.3571	0.0563	0.3122	0.1064	0.6750
US-035-041	SR 3 / SR 67	0.0387	0.1300	0.0000	0.0125	0.2362	0.2340	0.6500
US-041-005	SR 66 / Diamond Ave	0.1131	0.1066	0.1429	0.2469	0.0000	0.2979	0.4875
US-041-054	Hart St.	0.1845	0.6116	0.0000	0.0469	0.3676	0.2128	0.5000
US-041-056	SR 61 / US 50	0.1012	0.1948	0.0000	0.0656	0.3480	0.2979	0.5875
US-041-058	SR 67 / Co. Rd.	0.0298	0.0874	0.0000	0.0000	0.2731	0.2128	0.6875
US-041-114	SR 63	0.0476	0.0627	0.0000	0.0563	0.2916	0.2979	0.5750
US-041-273	State St. / Sibley St.	0.2292	0.4878	0.0476	0.0375	0.0000	0.2979	0.5750
US-041-276	SR 912	0.2530	0.5620	0.5000	0.2531	0.1215	0.2979	0.6375
US-050-065	SR 37 / Old US 50	0.2113	0.4660	0.0000	0.0438	0.1232	0.4468	0.9250
US-052-043	US 231	0.4583	0.8979	0.2143	0.1344	0.0486	0.2979	0.6875
US-052-044	SR 443 / Soldiers Home Rd.	0.0327	0.0518	0.2500	0.1219	0.0409	0.2979	0.4625

6. SUMMARY OF RECOMMENDATIONS

A recommended priority listing for interchange improvements is one of the two major products of this study. (Interchange summary data, as described in Chapter 4, is the other major product.) The priorities presented in this chapter are based on the application of a systematic approach at multiple locations to provide a common reference point for comparison.

Recommended priorities are presented in different ways for existing interchanges and potential new interchanges. At existing locations, the interchange needs prioritization model provides a ranking based on the seven factors described in Chapter 2. At potential new locations, a more qualitative review is presented, considering the benefit and feasibility review described in Chapter 3.

This chapter provides a priority listing for improvements to existing interchanges followed by recommendations and discussion regarding potential new interchange locations.

6.1 Existing Interchanges

Table 6-1 presents the priority ranking of existing interchange improvement projects generated by the interchange needs prioritization procedure. Site-specific values are shown for the seven input factors used to develop the overall interchange rating. These factors and their weighting values are presented and discussed in Chapters 2 and 5.

To provide for additional utility in the use of data and results related to the interchange needs prioritization model, the information in Table 6-1 is presented in another format in Appendix C. Rather than listing interchange locations by priority, they are listed by interchange identification number with the potential improvements summarized. This allows a reviewer or decision maker to more easily search for a particular location.

The table in Appendix C shows the needs priority ranking in the last column. It also shows actual input values rather than the weighted values presented in Table 6-1. In other words, actual values are shown for forecasted 2030 average daily traffic in lieu of a weighted model input value.

Both tables (Table 6-1 and Appendix C) "match" in terms of the information represented. This is one example among many of the flexibility available to INDOT in presenting the inventory data and analysis results data delivered electronically as an adjunct to this study.

The ranking of existing interchange needs in Table 6-1 provides an effective guide for decision making. Care and judgment should be applied in considering these results since no quantitative rating procedure can represent all of the factors to be taken into account. Recognizing this, the prioritization listing should be helpful in providing an objective foundation on which to base inclusion of interchange improvement projects in the Long Range Transportation Plan.

Table 6-1. Interchange Needs Prioritization

Existing "Standard" Interchange Evaluation - Weighted Normalized Scores - Sorted by Total										
	Weights	5	5	9.5	8	4.5	8	7	47	
	Normalized (Scaled Weights)	0.1064	0.1064	0.2021	0.1702	0.0957	0.1702	0.1489	1.0000	
Interchange ID	**Crossroad**	**Accident Severity**	**Accident Rate**	**Future LOS**	**Future ADT**	**PMPH % Trucks**	**Geometric Deficiency**	**Growth Rate**	**Total Score**	**Priority Ranking**
I-065-112B	I-70(N)	0.0896	0.0263	0.2021	0.1468	0.0152	0.1702	0.0968	0.7470	1
I-065-106	I-465	0.0716	0.0219	0.2021	0.1702	0.0163	0.0978	0.0931	0.6729	2
I-465-002	US 31 / Meridian	0.0519	0.0222	0.2021	0.1282	0.0286	0.1086	0.0949	0.6367	3
I-070-066	SR 267	0.0662	0.0525	0.2021	0.0622	0.0515	0.0507	0.0949	0.5802	4
I-069-111	SR 3 / US 27	0.0611	0.0343	0.2021	0.0638	0.0288	0.0869	0.0894	0.5665	5
I-265-003	SR 111	0.0649	0.0519	0.2021	0.0644	0.0103	0.0688	0.1024	0.5647	6
I-069-109	US 30 / US 33	0.1064	0.0713	0.1348	0.0564	0.0288	0.0616	0.0968	0.5560	7
I-070-079a	West	0.0282	0.0133	0.2021	0.0771	0.0661	0.0833	0.0652	0.5353	8
I-070-079c	McCarty / Pennsylvania/Madison	0.0215	0.0086	0.2021	0.0601	0.0721	0.0905	0.0726	0.5276	9
I-065-109	Raymond	0.0950	0.0494	0.1011	0.0548	0.0134	0.1195	0.0912	0.5243	10
I-065-113	Pennsylvania / Meridian/Delaware	0.1048	0.0412	0.1011	0.0394	0.0209	0.0942	0.1080	0.5095	11
I-074-066	SR 267	0.0450	0.0587	0.1588	0.0745	0.0374	0.0471	0.0819	0.5034	12
I-065-115	21st St	0.0548	0.0281	0.1227	0.0766	0.0151	0.0797	0.1173	0.4943	13
I-065-117	MLKJr	0.0456	0.0365	0.1083	0.0691	0.0209	0.0833	0.1154	0.4792	14
I-465-007	Mann	0.0364	0.0230	0.1733	0.0856	0.0298	0.0290	0.1005	0.4777	15
I-265-001	State	0.0649	0.0546	0.1516	0.0537	0.0108	0.0724	0.0633	0.4713	16
I-065-123	I-465	0.0500	0.0207	0.1011	0.1011	0.0254	0.0724	0.0949	0.4656	17
I-069-105	SR 14	0.0298	0.0192	0.1348	0.0670	0.0548	0.0688	0.0894	0.4636	18
I-065-178	SR 43	0.0570	0.0655	0.1083	0.0330	0.0651	0.0507	0.0726	0.4522	19
I-094-019	SR 249	0.0364	0.0261	0.1011	0.0426	0.0551	0.0761	0.1117	0.4491	20
I-065-247	US 231	0.0560	0.0712	0.1011	0.0452	0.0791	0.0254	0.0707	0.4487	21
I-064-119	US 150	0.0225	0.0216	0.2021	0.0027	0.0535	0.0507	0.0931	0.4461	22
US-020-099	IR-17	0.0579	0.1064	0.1011	0.0154	0.0302	0.0507	0.0838	0.4455	23
I-070-077	Holt	0.0437	0.0253	0.1516	0.0644	0.0264	0.0616	0.0689	0.4418	24
I-070-079b	Capitol / Illinois	0.0431	0.0205	0.0866	0.0559	0.0721	0.0688	0.0894	0.4363	25
I-065-090	SR 44	0.0310	0.0313	0.1299	0.0426	0.0544	0.0435	0.0894	0.4220	26
I-065-114	West	0.0193	0.0086	0.1348	0.0777	0.0098	0.0290	0.1285	0.4075	27
I-070-075	AirportExpwy	0.0111	0.0069	0.1444	0.0628	0.0277	0.0724	0.0801	0.4053	28
I-069-014	SR 13	0.0212	0.0250	0.1733	0.0362	0.0304	0.0398	0.0763	0.4022	29
I-069-019	SR 38	0.0237	0.0269	0.1299	0.0160	0.0628	0.0398	0.0931	0.3923	30
US-041-276	SR 912	0.0269	0.0598	0.1011	0.0431	0.0116	0.0507	0.0949	0.3881	31
US-030-065	SR 17 / Michigan St.	0.0282	0.0585	0.1011	0.0128	0.0778	0.0181	0.0912	0.3877	32
SR-002-039	SR 49	0.0358	0.0856	0.1011	0.0250	0.0265	0.0398	0.0726	0.3865	33
I-065-107	Keystone / (Old SR 431)	0.0526	0.0329	0.1011	0.0229	0.0489	0.0362	0.0912	0.3857	34
I-065-240	SR 2	0.0427	0.0557	0.1011	0.0271	0.0610	0.0181	0.0782	0.3840	35
I-069-026	SR 109 / SR 9	0.0507	0.0433	0.0578	0.0335	0.0433	0.0507	0.1043	0.3835	36
I-065-124	71st	0.0095	0.0099	0.1299	0.0314	0.0328	0.0616	0.1024	0.3775	37
I-070-023	SR 59	0.0209	0.0292	0.1083	0.0186	0.0942	0.0326	0.0689	0.3727	38
I-064-086	SR 37(N) / SR 66(S)	0.0155	0.0553	0.0000	0.0319	0.0931	0.0724	0.1043	0.3725	39
I-065-049	US 50	0.0215	0.0210	0.0289	0.0005	0.0907	0.1159	0.0931	0.3716	40
I-064-105	SR 135	0.0310	0.0365	0.1011	0.0229	0.0489	0.0326	0.0987	0.3716	41
I-065-016	Memphis - Bluelick	0.0196	0.0276	0.1011	0.0372	0.0552	0.0362	0.0931	0.3699	42
US-052-043	US 231	0.0488	0.0955	0.0433	0.0229	0.0047	0.0507	0.1024	0.3682	43
I-070-059	SR 39	0.0177	0.0197	0.1588	0.0266	0.0634	0.0109	0.0670	0.3641	44
I-074-113	SR 9	0.0130	0.0187	0.1011	0.0255	0.0474	0.0616	0.0894	0.3566	45
I-069-045	US 35 / SR 28	0.0127	0.0200	0.1011	0.0218	0.0624	0.0435	0.0949	0.3563	46
I-065-215	SR 114	0.0136	0.0224	0.1011	0.0181	0.0783	0.0362	0.0801	0.3498	47

Table 6-1. Interchange Needs Prioritization, cont.

Existing "Standard" Interchange Evaluation - Weighted Normalized Scores - Sorted by Total										
	Weights	5	5	9.5	8	4.5	8	7	47	
	Normalized (Scaled Weights)	0.1064	0.1064	0.2021	0.1702	0.0957	0.1702	0.1489	1.0000	
Interchange ID	**Crossroad**	**Accident Severity**	**Accident Rate**	**Future LOS**	**Future ADT**	**PMPH % Trucks**	**Geometric Deficiency**	**Growth Rate**	**Total Score**	**Priority Ranking**
I-065-146	SR 47	0.0051	0.0067	0.1011	0.0287	0.0637	0.0507	0.0894	0.3453	48
I-069-034	SR 67 / SR 32	0.0250	0.0247	0.0361	0.0415	0.0357	0.0978	0.0838	0.3446	49
I-069-041	SR 332	0.0165	0.0226	0.1011	0.0293	0.0439	0.0254	0.1043	0.3429	50
I-065-175	SR 25	0.0443	0.0444	0.0289	0.0383	0.0542	0.0507	0.0801	0.3409	51
US-020-008	Kennedy Ave.	0.0310	0.0608	0.1227	0.0085	0.0116	0.0181	0.0838	0.3366	52
I-080-015	US 6 / SR 51	0.0453	0.0372	0.0000	0.0681	0.0512	0.0507	0.0838	0.3362	53
US-020-010	SR 912 / Michigan St.	0.0446	0.0388	0.0963	0.0309	0.0128	0.0326	0.0801	0.3360	54
I-074-164	SR 1	0.0120	0.0248	0.1011	0.0128	0.0484	0.0398	0.0968	0.3357	55
US-030-090	SR 15	0.0263	0.0378	0.0578	0.0176	0.0957	0.0109	0.0894	0.3354	56
I-065-029	SR 56	0.0256	0.0301	0.0000	0.0452	0.0790	0.0579	0.0931	0.3309	57
I-265-004	SR 311	0.0462	0.0399	0.0650	0.0473	0.0093	0.0471	0.0745	0.3293	58
I-065-019	SR 160	0.0165	0.0243	0.0505	0.0255	0.0631	0.0543	0.0949	0.3292	59
I-070-078	Harding	0.0190	0.0106	0.0722	0.0676	0.0257	0.0507	0.0819	0.3277	60
I-069-129	SR 8	0.0554	0.0631	0.0000	0.0346	0.0489	0.0362	0.0875	0.3257	61
I-074-004	SR 63	0.0082	0.0211	0.1011	0.0096	0.0808	0.0435	0.0577	0.3220	62
I-094-026	SR 49	0.0193	0.0137	0.0000	0.0303	0.0450	0.0869	0.1247	0.3199	63
I-164-009	SR 62	0.0123	0.0195	0.0361	0.0330	0.0193	0.0507	0.1489	0.3198	64
I-074-061	CR275E	0.0085	0.0235	0.1011	0.0181	0.0374	0.0507	0.0801	0.3193	65
I-070-123	SR 3	0.0320	0.0433	0.0000	0.0319	0.0810	0.0543	0.0763	0.3189	66
I-069-064	SR 18	0.0133	0.0219	0.0505	0.0426	0.0535	0.0435	0.0931	0.3184	67
I-094-040	US 20	0.0117	0.0138	0.0000	0.0383	0.0926	0.1014	0.0577	0.3155	68
US-031-073	Indianapolis Ave. / Old SR 11	0.0272	0.0920	0.0144	0.0239	0.0109	0.0507	0.0949	0.3141	69
I-065-230	SR 10	0.0136	0.0199	0.1011	0.0170	0.0741	0.0036	0.0801	0.3094	70
I-070-115	SR 109	0.0190	0.0286	0.0578	0.0223	0.0812	0.0290	0.0689	0.3067	71
US-050-065	SR 37 / Old US 50	0.0225	0.0496	0.0000	0.0074	0.0118	0.0761	0.1378	0.3051	72
I-069-059	SR 22 / US 35	0.0155	0.0230	0.0000	0.0218	0.0708	0.0362	0.1359	0.3033	73
I-070-149	US 35 / Willamsburg Pike	0.0272	0.0372	0.0000	0.0271	0.0661	0.0724	0.0689	0.2990	74
I-065-076	US 31	0.0399	0.0452	0.0000	0.0000	0.0861	0.0326	0.0931	0.2969	75
I-074-058	SR 39	0.0028	0.0091	0.1011	0.0165	0.0693	0.0398	0.0577	0.2963	76
I-074-034	US 231	0.0136	0.0284	0.0217	0.0213	0.0949	0.0652	0.0503	0.2952	77
I-065-036	US 31	0.0190	0.0297	0.0000	0.0160	0.0628	0.0724	0.0931	0.2930	78
US-031-212	SR 25	0.0139	0.0476	0.0722	0.0096	0.0299	0.0181	0.1005	0.2918	79
I-064-025	US 41	0.0177	0.0182	0.0000	0.0319	0.0925	0.0724	0.0540	0.2868	80
I-069-022	SR 9 / SR 67	0.0155	0.0144	0.0217	0.0394	0.0385	0.0652	0.0912	0.2859	81
I-069-154	SR 127 / SR 727	0.0104	0.0225	0.0505	0.0090	0.0497	0.0724	0.0689	0.2835	82
I-069-134	US 6	0.0155	0.0268	0.0000	0.0223	0.0493	0.0688	0.1005	0.2832	83
I-094-034	US 421	0.0130	0.0151	0.0000	0.0309	0.0363	0.0905	0.0875	0.2732	84
I-069-126	CR11A	0.0130	0.0199	0.0289	0.0202	0.0511	0.0507	0.0894	0.2732	85
I-074-169	US 52	0.0076	0.0141	0.0505	0.0144	0.0429	0.0362	0.1043	0.2699	86
SR-062-027	Garvin St.	0.0256	0.0381	0.0144	0.0484	0.0116	0.0507	0.0782	0.2671	87
I-069-055	SR 26	0.0066	0.0125	0.0000	0.0181	0.0671	0.0507	0.1098	0.2649	88
I-469-029	Maplecrest	0.0063	0.0088	0.0722	0.0266	0.0250	0.0507	0.0745	0.2641	89
I-080-016	I-94	0.0133	0.0097	0.0289	0.0601	0.0596	0.0507	0.0391	0.2614	90
I-074-134	SR 3	0.0063	0.0121	0.0000	0.0128	0.0462	0.0761	0.1061	0.2595	91
I-065-168	SR 38	0.0313	0.0281	0.0000	0.0367	0.0652	0.0181	0.0801	0.2595	92
I-074-149	SR 229	0.0082	0.0112	0.0000	0.0176	0.0723	0.0543	0.0949	0.2586	93
I-265-009	SR 62	0.0051	0.0106	0.0674	0.0394	0.0099	0.0507	0.0745	0.2575	94

Table 6-1. Interchange Needs Prioritization, cont.

Existing "Standard" Interchange Evaluation - Weighted Normalized Scores - Sorted by Total										
	Weights	5	5	9.5	8	4.5	8	7	47	
	Normalized (Scaled Weights)	0.1064	0.1064	0.2021	0.1702	0.0957	0.1702	0.1489	1.0000	
Interchange ID	**Crossroad**	**Accident Severity**	**Accident Rate**	**Future LOS**	**Future ADT**	**PMPH % Trucks**	**Geometric Deficiency**	**Growth Rate**	**Total Score**	**Priority Ranking**
I-064-039	SR 61	0.0155	0.0536	0.0000	0.0027	0.0547	0.0507	0.0801	0.2572	95
I-070-041	US 231	0.0146	0.0170	0.0072	0.0255	0.0644	0.0217	0.1043	0.2547	96
I-064-079	SR 37(S)	0.0022	0.0083	0.0000	0.0005	0.0903	0.0507	0.1024	0.2545	97
I-070-137	SR 1	0.0054	0.0088	0.0505	0.0271	0.0675	0.0072	0.0875	0.2541	98
I-094-022	US 20	0.0146	0.0110	0.0000	0.0447	0.0604	0.0290	0.0894	0.2490	99
US-020-082	Ironwood Rd.	0.0000	0.0000	0.0674	0.0218	0.0252	0.0000	0.1322	0.2466	100
I-070-051	CR1100W / County Rd.1100 West	0.0044	0.0066	0.0000	0.0186	0.0700	0.0507	0.0931	0.2435	101
I-074-039	SR 32	0.0104	0.0297	0.0217	0.0133	0.0909	0.0217	0.0521	0.2398	102
US-041-054	Hart St.	0.0196	0.0651	0.0000	0.0080	0.0352	0.0362	0.0745	0.2386	103
I-164-005	SR 662	0.0196	0.0316	0.0217	0.0271	0.0150	0.0507	0.0726	0.2383	104
I-275-016	US 50	0.0009	0.0010	0.0144	0.0298	0.0260	0.0507	0.1154	0.2382	105
US-020-079	US 31 / US 31 Extention	0.0047	0.0042	0.0000	0.0266	0.0292	0.0254	0.1434	0.2335	106
SR-023-039	SR 933 / Lincolnway	0.0082	0.0101	0.0674	0.0165	0.0163	0.0471	0.0670	0.2326	107
US-041-273	State St. / Sibley St.	0.0244	0.0519	0.0096	0.0064	0.0000	0.0507	0.0856	0.2286	108
US-041-005	SR 66 / Diamond Ave	0.0120	0.0113	0.0289	0.0420	0.0000	0.0507	0.0726	0.2176	109
I-074-109	Fairland	0.0089	0.0162	0.0000	0.0160	0.0416	0.0507	0.0819	0.2153	110
US-041-056	SR 61 / US 50	0.0108	0.0207	0.0000	0.0112	0.0333	0.0507	0.0875	0.2142	111
I-069-150	CR200W	0.0035	0.0071	0.0000	0.0596	0.0140	0.0435	0.0856	0.2132	112
SR-062-020	University Blvd. / Eickhoff Rd.	0.0285	0.0377	0.0072	0.0287	0.0091	0.0290	0.0707	0.2110	113
SR-062-026	Main St.	0.0111	0.0153	0.0000	0.0415	0.0116	0.0507	0.0782	0.2084	114
US-020-084	SR 331 / Bremen Hwy.	0.0044	0.0068	0.0505	0.0229	0.0247	0.0109	0.0875	0.2076	115
SR-062-024	Barker Ave.	0.0025	0.0044	0.1011	0.0479	0.0116	0.0398	0.0000	0.2073	116
US-052-044	SR 443 / Soldiers Home Rd.	0.0035	0.0055	0.0505	0.0207	0.0039	0.0507	0.0689	0.2038	117
US-020-093	SR 19	0.0000	0.0000	0.0144	0.0255	0.0285	0.0254	0.0931	0.1870	118
US-020-096	US 33 / SR 933	0.0003	0.0004	0.0217	0.0218	0.0307	0.0181	0.0931	0.1860	119
US-041-114	SR 63	0.0051	0.0067	0.0000	0.0096	0.0279	0.0507	0.0856	0.1856	120
US-035-041	SR 3 / SR 67	0.0041	0.0138	0.0000	0.0021	0.0226	0.0398	0.0968	0.1793	121
US-041-058	SR 67 / Co. Rd.	0.0032	0.0093	0.0000	0.0000	0.0261	0.0362	0.1024	0.1772	122

6.2 Potential New Interchanges

Unlike existing interchanges, potential new interchange locations are not subjected to a data-driven needs prioritization model to establish recommended priorities. First of all, a common base of operations data is not available since the interchanges do not exist. Secondly, since the interchanges are at various stages of early planning, their definition and justification has not been established to the same degree.

In lieu of a prioritization model driven by operations data, the priority setting process for proposed new interchanges is based on a feasibility review (considering factors identified in Chapter 3) and a qualitative assessment of the effectiveness of each interchange in achieving its identified purpose.

It is significant to note that the issue of new interchanges is fluid and subject to change over time as surrounding conditions change and as more is learned from ongoing planning studies. Findings and recommendations presented here are based on the best information currently available. Most of this information was provided by involved local agencies.

A planning level right-of-way footprint has been developed for each potential new interchange location and can be viewed by the GIS application or by a figure in each new interchange report. The right-of-way footprints have been developed to contain a very "high-type" interchange design. Right-of-way requirements could be significantly less based on a more detailed study and design development.

SUMMARY MATRIX

To aid in the review of potential new interchanges, a summary matrix has been prepared to show the justification or benefit of the fifteen locations under study, and to indicate their apparent feasibility with respect to state and federal requirements. The interchanges have been further divided by Interstate and non-Interstate, since Federal Interstate requirements do not apply directly to non-Interstate locations. This summary matrix is presented as Table 6-2.

The summary matrix is presented in four parts. Potential interchange locations are listed, including the county where the site is located. Justification and/or benefits are indicated according to the three categories described in Chapter 3. Information related to apparent feasibility is presented, and notes are provided for each location. The bottom of the table indicates recommended priorities, based on Interstate or arterial system benefits, local transportation system benefits, and/or economic development benefits. Projects followed by "(tentative)" are those where information is not fully supported by pertinent planning studies.

Within the justification/benefit section, a large bold **X** indicates primary achievement and a small x indicates secondary or partial achievement of the purpose shown. With respect to economic development, some locations will be zoned to prohibit interchange related development. These are indicated by a **NO** in that column. At other locations, there is

recognition that some development would be induced. Five locations (shown with a bold **X**) show economic development as a primary justification.

FEASIBILITY REVIEW

As indicated on Table 6-2, all of the potential interchange locations reviewed are apparently feasible with respect to federal requirements, including Interstate access and environmental requirements. That is, no fatal flaws were identified at any of the proposed locations. It should be noted that six locations (I-65/CR 300N, I-69/Cyntheanne Road, I-74/SR 47, I-94/County Line Road, I-164/Millersburg Road and I-865/Cooper Road) meet federal interchange spacing criteria, but do not meet the rural criteria of the state. These locations would meet INDOT's urban interchange spacing criteria. In each case, the sites are just outside an urbanized area, and there is uncertainty regarding their continuing rural character.

As might be expected, most of the locations are not currently fully supported by local plans. Three interchanges (I-69/Gump Road, I-70/German Church Road and I-164/Millersburg Road) are supported by local and MPO plans. Two interchanges (I-65/CR 300N and I-74/CR 80NE) have local plan support and MPO support is not an issue since they are not within an urbanized area. Three interchanges (I-65/CR 750N, I-69/Cyntheanne Road and I-94/County Line Road) have local support but no indication that they will be considered as part of the MPO transportation plan. Two interchanges (I-70/Tabortown Road and I-865/Cooper Road) have local support but incomplete or pending support for inclusion in the MPO transportation plans. A current lack of planning support could affect timing, but would not necessarily indicate a fatal flaw if planning support is established at a later time.

Table 6-2. Potential New Interchange Summary Matrix

Location			Justification/Benefit			Apparent Feasibility					
			Interstate	Local	Economic	FHWA	Env	Plan Support		Economic	
Interchange		County	System	System	Devt	Rqmts	(NEPA)	MPO	Local	Devt	Other
I-065-098	CR 750N	Johnson	x	**X**	induced	Yes	Yes	No	Yes	New	Included in Greenwood Thoroughfare Plan, not in MPO Transportation Plan
I-065-143	CR 300N (US 52 Reloc.)	Boone	**X**	**X**	induced	Yes*	Yes	--	Yes	New	Further analysis is needed to determine if reconstructing existing interchange is a better alternative
I-069-012	Cyntheanne Rd.	Marion	x	**X**	induced	Yes*	Yes	No	Yes	New	More detailed study is needed to determine potential diversion of traffic from adjacent interchanges. Requires MPO support.
I-069-118	Gump/Hursh Rd	Allen	**X**	**X**	induced	Yes	Yes	Yes	Yes	New	It has been requested by the INDOT District and NIRCC to be included in the Major Moves Projects for 2016.
I-070-015	Tabortown Rd.	Vigo	**X**	x	**X**	Yes	Yes	(Yes)	Yes	New	Listed in the "MPO 2030 Long Range Transportation Plan" as an illustrative project in the 2021 – 2030 implementation period
I-070-093	German Church Rd	Marion	x	**X**	induced	Yes	Yes	Yes	Yes	Exist.	The interchange is currently listed as a priority in the MPO plan for implementation in 2011-2020
I-074-020	S.R. 341	Fountain	x	**X**	induced	Yes	Yes	--	(Yes)	New	It appears that some right-of-way was obtained for the interchange when I-74 was constructed. Local plan support needed.
I-074-036	S.R. 47	Montgomery	x	x	**X**	Yes*	Yes	--	(Yes)	Exist/New	Primary benefits would include reduction of truck traffic in downtonw Crawfordsville and economic development. Local plan support needed.
I-074-136	CR 80NE/CR 200E	Decatur	x	**X**	**X**	Yes	Yes	--	Yes	Exist/New	Primary benefits would include reduction of truck traffic in downtonw Greensburg and economic development
I-094-032	County Line Rd	LaPorte/Porter	x	**X**	**X**	Yes*	TBD	No	Yes	Exist/New	Air quality conformity may be an issue. A traffic reduction at the high accident intersection of Kieffer Rd. & US 421 would be a benefit.
I-164-012	Millersburg Rd.	Vanderburgh	x	**X**	**X**	Yes*	Yes	Yes	Yes	Exist.	Significant traffic reduction at the high accident intersection of SR 57 and E. Boonville-New Harmony Rd. would have a safety benefit.
I-865-002	Cooper Rd	Boone	**X**	**X**	NO	Yes*	Yes	TBD	Yes	Restricted	Adopted in Boone County and Zionsville Plans/MPO review pending
US-030-063	Pine Rd.	Marshall	--	**X**	NO	--	Yes	TBD	Yes	Exist.	Congestion relief and safety benefits have not been established and more detailed studies are required. Not currently in the MPO Transp. Plan.
US-031-224	Lincoln Hwy.	Marshall	--	**X**	induced	--	Yes	Yes	Yes	New	Primary benefits would be reduced traffic on Michigan Road and other local streets, and more direct access to east side of Plymouth.
US-031-265	Adams Rd.	St. Joseph	**--**	x	**X**	**--**	Yes	TBD	Yes	New	MACOG Transporation Plan supports improvements to US 31 in the interchange area, but does not include the interchange in projects.

*INDOT rural interchange spacing criteria of 3 miles not met at this location.
(Yes) Indicates that questionnaire responses were positive, but an official plan has not been adopted

Priorities - Interstate System
I-65/CR 300N
I-69/Gump & Hursh Road
I-70/Tabortown Road (Partial)
I-865/Cooper Road

Priorities - Economic Development
I-70/Tabortown Road
I-74/SR 47
I-74/CR 80NE/CR 200E
I-94/County Line Road
I-164/Millersburg Road
US-31/Adams Road

Priorities - Local System
I-65/CR 750N (Tentative)
I-65/CR 300N
I-69/Cyntheanne Road (Tentative)
I-69/Gump & Hursh Road
I-70/German Church Road
I-74/SR 341
I-74/CR 80NE/CR 200E
I-94/County Line Road (Tentative)
I-164/Millersburg Road
I-865/Cooper Road (Tentative)
US-30/Pine Road

Priorities - Local System, Cont.
US-31/Lincoln Highway

Additional study needed for consensus/justification
I-65/CR 750N -- MPO plan support needed
I-65/CR 300N -- Study of US 52 interchange relocation
I-69/Cyntheanne -- MPO plan support needed
I-70/Tabortown Road -- MPO priority needed
I-74/SR 47 -- Local plan support needed
I-94/County Line Road -- MPO plan support needed
I-865/Cooper Road -- MPO plan support needed
US-30/Pine Road -- MPO Plan support needed
US-31/Adams Road -- MPO Plan support needed

In this study, priorities for potential new interchange locations are presented in three categories, consistent with the fundamental benefit(s) each interchange would provide. Interchanges that achieve more than one purpose may warrant higher overall priority. These recommendations are structured to provide flexibility for decision makers in considering the type of benefit as well as the degree to which the benefit is achieved.

Following is a listing of recommended interchange priorities ranked according to intended purpose. In addition to listing the interchanges under each benefit category, a brief summary is provided for each location. The purpose of the interchange is described, pertinent background data is noted, and the current planning status of the project is reviewed.

A. INTERSTATE SYSTEM PRIORITIES

Some interchanges are proposed primarily for their benefits to the Interstate System. These benefits are achieved by diverting traffic from one or more existing interchanges that are (or are expected to be) highly congested. In most cases, these interchanges also benefit local roadway systems by shifting traffic from heavily loaded access routes.

The following interchanges are presented and described without any order of recommended priority with respect to Interstate System benefits:

1. I-65 and CR 300N (I-065-143 Boone County)
   This interchange would replace the existing partial interchange of I-65 and U.S. 52 and would be located approximately 2-1/2 miles north of the S.R. 32 interchange in Boone County. Approximately 11,000 vehicles per day would be expected to divert from S.R. 32 east of the I-65 interchange (I-065-140) due to its improved access to the north side of Lebanon. The existing I-65/U.S. 52 interchange has a southbound left-hand exit ramp, which typical have crash rates 1.5 to 2 times higher than right-hand ramps. The potential benefits to the Interstate System and local street system indicates a need for further study to determine whether improvements to the existing I-65/U.S. 52 interchange would be a better alternative.

2. I-69 and Gump-Hursh Road (I-069-118 Allen County)
   This interchange would be located approximately three miles north of SR 1 in Allen County. It would benefit four interchanges in or near Fort Wayne, on I-469 as well as I-69. The interchange that would benefit the most is the I-69/S.R. 1 interchange. The level of service analysis of future 2030 traffic indicates that ramps and the west intersection would operate at LOS F without improvement. The west intersection would improve to LOS D if the new interchange is constructed. The interchange was proposed by the MPO and has full planning support. A regional travel simulation model was used to test the traffic benefits of the interchange and the planning process provided an opportunity for public input. Due to its location near the edge of the urbanized area, there is local concern over potential impacts on urban sprawl. Zoning is in place to discourage this. The MPO suggests 2016 construction as a Major Moves project.

3. I-70 and Tabortown Road (I-070-015 Vigo County)
   This interchange would be located approximately four miles east of SR 46 and 2 miles east of the planned SR 641 bypass in Vigo County. The statewide travel demand model indicates that this interchange would divert approximately 10,000 vehicles per day from SR 46 north of I-70. Currently the folded diamond ramps at the I-70/SR 46 interchange operate under stop control. If signals are not installed at these intersections, the expected 2030 level of service would be "F". The diversion of some traffic to the new Tabortown Road interchange could delay the need for signalization or if signalized, improve the future level of service.

4. I-865 and Cooper Road (Marion County)
   This location is near the midpoint on the I-865 "dogleg" northwest of Indianapolis, between I-465 and I-65. Since it is located between two "system" interchanges that provide no local access, it would impact several interchange locations that are not in close proximity: I-465/Michigan Road, I-465/86th Street, and I-65/SR 334. Each of these interchanges is expected to be congested in the future. Due to its effect of removing through traffic from the town, Zionsville recommended this interchange in a 1988 planning study. The interchange is now included in the adopted transportation plan for Boone County as well as Zionsville. An overlay zone has been proposed by Zionsville to restrict or prohibit commercial development near the site. This interchange has not been previously evaluated by the Indianapolis MPO; however, the Town of Zionsville has formally requested that the MPO incorporate the interchange in the current update of the regional transportation plan. Regional simulation modeling is needed to quantify the potential benefits to nearby interchanges.

B. LOCAL SYSTEM PRIORITIES

At some locations, the best solution to local transportation problems may involve the installation of a new interchange. Providing alternate access points to the Interstate System can reduce indirect trips and concentrations of traffic on interchange access routes. In some cases, these adjacent interchanges are themselves overloaded, resulting in benefits to both systems.

The following interchanges are presented and described without any order of recommended priority with respect to local roadway system benefits:

1. I-65 and CR 750N (I-065-098 Johnson County)
   This site is located approximately 2 miles south of the CR 950 N (Greenwood) interchange, which currently operates at level of service E (ramp). There appear to be no fatal flaws with the proposed new interchange at I-65 and County Road 750 N. This interchange would provide improved access for new development south of Greenwood, an area that is currently growing. Modeling results, however, suggest that the major benefits of this interchange may be localized. More detailed analysis is required to verify the benefits of the proposed interchange and determine whether local road improvements may be an appropriate alternative. Location of a potential east-west cross county corridor along CR 750 N could significantly increase the potential need and benefits of this interchange. This interchange has been included in

the official Thoroughfare Plan for the City of Greenwood. A December 8, 2006 letter from the Johnson County Board of Commissioners also supports the interchange. The interchange is not included in the Indianapolis MPO Regional Transportation Plan.

2. I-65 and CR 300N (I-065-143 Boone County)
   This interchange was listed (and previously described) among interchanges benefiting the Interstate System. Approximately 11,000 vehicles per day would be expected to divert from S.R. 32 east of the I-65 interchange (I-065-140) due to its improved access to the north side of Lebanon. This should improve traffic conditions on S.R. 32 and S.R. 39 through Lebanon. This interchange location is currently included in the Lebanon Comprehensive Plan.

3. I-69 and Cyntheanne Road (I-069-012 Hamilton County)
   This interchange would be located a little over 2 miles north of the existing S.R. 238 interchange and 2 miles south of the S.R. 13 interchange. Cyntheanne Road is a primary arterial identified as a major north-south road in the MPO and county thoroughfare plans. It has been planned to provide Interstate access to the rapidly developing area south and east of I-69. Hamilton County has taken the initiative to study possible interchange alternatives based on a build-out of developable land. Regional planning support from the MPO is needed.

4. I-69 and Gump (or Hursh) Road (I-069-118 Allen County)
   This interchange was listed (and previously described) among interchanges benefiting the Interstate System. It would relieve nearby interchanges and access routes by providing a more direct route for many trips, as indicated by simulation modeling. This project has full planning support from the local MPO.

5. I-70 and German Church Road (I-070-093 Marion County)
   This interchange would be located about two miles east of Post Road and 3 miles west of Mount Comfort Road. It has been in the Indianapolis Regional Transportation Plan since 1968. It has full local planning support from the MPO. The new interchange would provide more direct access to I-70 from 21st St. and 10th St. from the south and from 38th St. from the north. The travel demand model indicates a significant traffic reduction (7,000 ADT) on Washington Street west of German Church Road, and an increase on I-70 of approximately 15,000 ADT. The MPO recommends construction between 2011-2020.

6. I-74 and S.R. 341 (I-074-020 Fountain County)
   This interchange would be located about five miles east of the I-74/U.S. 41 interchange. Traffic volumes at the existing adjacent interchanges (I-074-015 and I-074-025) are very low and should not have any operational problems with or without the new interchange. The county commented that an interchange would reduce truck traffic, particularly grain trucks, on east-west county roads that are destined to I-74 using U.S. 41 to the west and S.R. 25 to the east (both about 5 miles away from Hillsboro). The benefits of the new interchange are reduced truck traffic on county roads, improved emergency access to I-74 and potential economic development.

7. I-74 and CR 80NE/CR 200E (Decatur County)
   Approximately 2,000 vehicles per day are projected to divert from SR 3 south of I-74 to this proposed interchange location, reducing future traffic at the Freeland Road intersection. The new interchange would provide more direct truck traffic access to I-74 from US 421 southeast and SR 46 east, reducing significantly the number of trucks being routed through downtown Greensburg.

8. I-94 and County Line Road (I-094-032 LaPorte/Porter County)
   This interchange would be located about two miles west of the U.S. 421 interchange. Diversion of approximately 3,000 ADT from U.S. 421 in the year 2030 would probably have a positive benefit on the high accident experience at Kieffer Rd. and U.S. 421. There are no negative impacts or benefits to the Interstate system anticipated.

9. I-164 and Millersburg Road (I-164-012 Vanderburgh County)
   This interchange would be located about two and one-half miles north of Lynch Road and about 3 miles south of New Harmony Road. Traffic would be diverted from U.S. 41 and Green River Road, which are parallel roads west of I-164. Added lanes for Green River Road may not be needed by the year 2030 if the interchange is constructed. Improvements to U.S. 41 could possibly be delayed. Traffic volumes entering the intersection of S.R. 57 and E. Boonville - New Harmony Road would be reduced by an estimated 7,000 vehicles per day. This intersection was recently listed among the top 5% of the highest accident locations in Indiana.

10. I-865 and Cooper Road (I-865-002 Boone County)
    This interchange was listed (and previously described) as one of the proposed interchanges benefiting the Interstate System. Based on the anticipated traffic volumes on regional roadways with and without the new interchange, modest benefits could be anticipated at the interchanges of I-65/SR 334, I-465/US 421 and I-465/86th Street. Traffic could be expected to decrease through the Town of Zionsville, especially truck traffic. More detailed studies are needed to determine the magnitude of reduction. The interchange is included in both Boone County and Zionsville transportation plans. It would provide a more direct route for many users to the Interstate System and would have minimal impact on Interstate System operations due to the particularly low traffic volumes on this "dogleg" section of I-865.

11. US-30 and Pine Road (US-030-063 Marshall County)
    The interchange is proposed for congestion relief and safety improvement in the US 30 corridor through Plymouth. More detailed analysis is needed to determine whether the interchange would have the desired benefits. Other improvements may better address the problems or may be necessary in conjunction with a new interchange. In addition, while the Plymouth Comprehensive Plan identifies a proposed new interchange on US 30, the identification of the Pine Road location does not appear to be the result of a comprehensive planning or engineering analysis.

12. US-31 and Lincoln Highway (US-031-224 Marshall County)
    This proposed interchange would improve access to the east side of Plymouth. It

would have no significant impact on either US 31 or adjacent US 30. It would reduce travel on Michigan Road and other local roads in the Plymouth area. The congestion and safety benefits to the local roadway system are not anticipated to be substantial but could not be quantified by this study process.

C. ECONOMIC DEVELOPMENT PRIORITIES

Several agencies mentioned economic development as one of the benefits of interchange construction, and this was highlighted as the primary purpose at five locations. The following interchanges are presented and described without any order of recommended priority with respect to economic development benefits:

1. I-70 and Tabortown Road (I-070-015 Vigo County)
   This interchange was listed (and previously described) as one of the proposed interchanges benefiting the Interstate System. This interchange would provide access for potential industrial development of abandoned coal mines east of Tabertown Road, both north and south of I-70, to be developed as part of the proposed Vigo County Industrial Park. It would also serve potential development on the east side of Terre Haute, particularly east of SR 46.

2. I-74 and S.R. 47 (Montgomery County)
   This interchange is proposed to better serve existing industry and to encourage additional commercial development. A shorter travel route would be provided for existing plants along S.R. 47. A shorter access route with fewer conflict points would improve access and reduce truck traffic through residential areas and downtown Crawfordsville. There is also a new road being built south of the proposed interchange (Memorial Drive) that will allow hundreds of acres to be developed. Additional local study is recommended to better define potential benefits and to consider the improvement in the context of local plans.

3. I-74 and CR 80NE/CR 200E (Decatur County)
   The new interchange would serve an industrial park on the east side of Greensburg and open the northeast to new commercial/industrial development per comprehensive plans.

4. I-94 and County Line Road (I-094-032 LaPorte/Porter County)
   This interchange was listed (and previously described) as an interchange that would potentially benefit the local roadway system. Development potential along County Line Road would benefit from additional Interstate access. The interchange would provide better access to Michigan City and enhance opportunities for economic development in the area.

5. I-164 and Millersburg Road (I-164-012 Vanderburgh County)
   This interchange was listed (and previously described) as an interchange that would potentially benefit the local roadway system. The proposed interchange would provide a direct access point to the largest airport within 150 miles. This could translate to more tourism, more shipments of goods, more jobs, etc.

6. US 31 and Adams Road (St. Joseph County)

The primary purpose of the proposed interchange is to provide access to new development in the vicinity of US 31 and Adams Road. According to submitted information, the interchange would directly contribute to the development of 450 acres of industrial, commercial and office property, with a potential to create and retain up to 4,000 new jobs. Support provided by local agencies, but the interchange was not explicitly included in the South Bend Comprehensive Plan nor the MACOG Long Range Transportation Plan.

D. FINAL RECOMMENDATIONS

The "case" for a new interchange is influenced by previous planning efforts and local commitment in addition to the physical and operational characteristics of the proposed site. The justification for some interchanges may be strengthened by further studies (or changed conditions), suggesting flexibility by INDOT in considering these locations over time. Considering the inputs and information gathered during the time of this study, as summarized on Table 6-2, three interchange locations top the list in terms of the three priority categories used in this study, as listed below:

1. I-69 & Gump/Hursh Road (I-069-118)

   This interchange ranked high in two of the three priority categories. It is driven nearly entirely by transportation needs and would benefit both the local and Interstate System. Land use impacts would be minimized through zoning. There is strong local support for the project.

2. I-65 & CR 300N (US 52 Relocation) (I-065-143)

   This interchange was proposed to replace the existing interchange of I-65 with U.S. 52. A current design study is underway by INDOT for this section of I-65 and the results of that study should be used to compare the benefits of improving the existing interchange with the benefits of a new interchange. The new interchange has local planning support.

3. I-865 & Cooper Road (I-865-002)

   This interchange ranked high in two of the three priority categories. It is driven nearly entirely by transportation needs and would benefit both the local and Interstate System. Land use impacts would be minimized through zoning. There is strong local support for the project; however, the interchange is not currently in the MPO Transportation Plan and should be studied in the context of regional priorities.